

**FLUOR FERNALD CLOSURE PLAN  
BASIS OF ESTIMATE**

**PBS-07  
SILOS PROJECT**

**SEPTEMBER 2001**

**40000-PL-0001  
REVISION 1**





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- 3.6 Title III Support - Fernald
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- 3.9 Remedial Action
- 3.10 Shutdown

## 4.0 Estimate

## 5.0 Risk Plan

## Section 2: HS3A – Silo 3

### ACRONYMS

ACE	Army Corp of Engineers
AEA	Atomic Energy Act
AEDO	Assistant Emergency Duty Officer
ALARA	As Low As Reasonably Achievable
API	American Petroleum Institute
APR	Air Purifying Respirator
ARAR	Applicable, Relevant and Appropriate Requirement
ASR	Auditable Safety Record
ATSDR	Association of Toxic Substance and Disease Registry
AWP	Automated Work Package
AWR	Advanced Waste Retrieval
AWWT	Advance Wastewater Treatment
BAT	Best Available Technology
CADD	Computer Aided Drafting and Design
CAM	Control Account Manager
CAT	Critical Analysis Team
CAT	Construction Acceptance Testing
CBA	Collective Bargaining Agreement
CC	Construction Coordinator
CCM	Construction Contracts Manager
CCTV	Closed Circuit Television
CE	Construction Engineer
CEDE	Committed Effective Dose Equivalent
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFC	Certified for Construction
CFR	Code of Federal Regulations
COC	Constituent of Concern
CONOPS	Conduct of Operations
D&D	Decontamination and Dismantlement
DCF	Dose Conversion Factor
DCN	Design Change Notice
DFS	Duratek Federal Services
DNFSB	Defense Nuclear Facility Safety Board
DOE	Department of Energy
DOE-FEMP	Department of Energy – Fernald Environmental Management Project
DOE-HQ	Department of Energy - Headquarters
DOE-OFO	Department of Energy – Ohio Field Office
DOP	Diocetyl Phthalate
DOT	Department of Transportation
ECDC	Engineering/Construction Documentation Control
EIP	Energy Isolation Plan
EOC	Emergency Operations Center



**Section 2: HS3A – Silo 3**

EP	Extraction Procedure
EPA	Environmental Protection Agency
ESD	Explanation of Significant Differences
FAM	Functional Area Manager
FAT&LC	Fernald Atomic Trades and Labor Council
FEMP	Fernald Environmental Management Project
FHA	Fire Hazard Analysis
FHAR	Final Hazard Analysis Report
FIU	Florida International University
FMEA	Failure Modes and Effects Analysis
FTE	Full Time Equivalent
FY	Fiscal Year
GAO	General Accounting Office
GCBCTC	Greater Cincinnati Building and Construction Trades Council
GFE	Government Furnished Equipment
GSA	Government Services Administration
H&S	Health and Safety
H&SC	Health and Safety Controls
HAR	Hazard Analysis Report
HASP	Health and Safety Plan
HC	Hazard Category
HCC	Hazard Category Calculations
HDPE	High Density Polyethylene
HEO	Heavy Equipment Operator
HEPA	High Efficiency Particulate Air
HFE	Human Factors Evaluation
HPP	Health Physics Plan
ICE	Independent Cost Evaluation
IFB	Invitation for Bid
IG	Inspector General
IHA	Integrated Hazard Analysis
INEEL	Idaho National Engineering and Environmental Laboratory
IP-2	Industrial Package Type 2
IRT	Independent Review Team
ISA	Interim Storage Area
LLW	Low-Level Waste
LSA	Low Specific Activity
LSA-II	Low Specific Activity-II
MCC	Motor Control Center
MVO	Motor Vehicle Operator
NC	Nuclear Criticality
NMD	Nuclear Materials Disposition
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission

## Section 2: HS3A – Silo 3

NSOA	Nuclear Safety Operational Authorization
NTS	Nevada Test Site
ODC	Other Direct Cost
OEPA	Ohio Environmental Protection Agency
OJT	On-the-job Training
ORR	Operational Readiness Review
OSDF	On-Site Disposal Facility
OSHA	Occupational Safety and Health Administration
OU	Operable Unit 4
P&ID	Piping and Instrumentation Diagram
PAPR	Powered Air Purifying Respirator
PBS	Project Budget Sheet
PCR	Project Closure Report
PEP	Project Execution Plan
PFD	Process Flow Diagram
PHAR	Preliminary Hazard Analysis Report
PLA	Project Labor Agreement
POA	Plan of Action
POD	Plan of the Day
PPE	Personal Protective Equipment
PSHSRM	Project Specific Health and Safety Requirements Matrix
PWID	Project Waste Identification and Disposition
QA	Quality Assurance
QAJSP	Quality Assurance Job-Specific Plan
QC	Quality Control
QEP	Quality Evaluation Plan
RA	Remedial Action
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDWP	Remedial Design Work Plan
RFI	Request for Clarification of Information
RFP	Request for Proposal
RI/FS	Remedial Investigation/Feasibility Study
RIP	Readiness Implementation Plan
RMRS	Rocky Mountain Remediation Services
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SIP	Service Interruption Permit
SOT	System Operability Testing
SOW	Statement of Work
SSC	System, Structures and Components
SSR	Standard Startup Review
SWP	Safe Work Plan

## Section 2: HS3A – Silo 3

T&QP	Training and Qualification Plan
TBC	To Be Considered Criteria
TCLP	Toxicity Characteristic Leaching Procedure
TRB	Technical Review Board
TSR	Technical Safety Requirement
UC	University of Cincinnati
ULPA	Ultra Low Penetration Air
USEPA	United States Environmental Protection Agency
USQ	Unreviewed Safety Question
VitPP	Vitrification Pilot Plant
WAC	Waste Acceptance Criteria
WGS	Waste Generators Services
WPRAP	Waste Pits Remediation Action Project

### MEASUREMENTS

cm	centimeters
ft <sup>3</sup>	cubic feet
g/cm <sup>3</sup>	grams per cubic centimeter
gpm	gallons per minute
lb	pound
lbs/hr	pounds per hour
mrem/hr	millirem per hour
pCi/g	picocuries per gram
pCi/L	picocuries per liter
ppm	parts per million
psi	pounds per square inch
yd <sup>3</sup>	cubic yards







**WBS DICTIONARY**  
**CONTROL ACCOUNT/CHARGE NUMBER**





U.S. DEPARTMENT OF ENERGY  
WORK BREAKDOWN STRUCTURE DICTIONARY  
PART II - ELEMENT DEFINITION

1. PROJECT TITLE  FEMP (DEFENSE)	2. DATE OF CONTRACT  12/01/2000								
3. IDENTIFICATION NUMBER  DE-AC24-010H20115	4. INDEX LINE NO.  68								
5. WBS ELEMENT CODE  1.1.H	6. WBS ELEMENT TITLE  PBS 07 SILOS								
7. APPROVED CP NO.  NEW PER CP# FY01-0115-0007-00	8. DATE OF CHANGES  12/01/2000								
9. SYSTEM DESIGN DESCRIPTION  CERCLA / ACA	10. BUDGET AND REPORTING NUMBER  EW05H3070								
11. ELEMENT TASK DESCRIPTION  <p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Material ODC's Subcontractors</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Amended Consent Agreement with the U.S. EPA, appropriate actions will be taken to characterize and remediate hazardous environmental conditions associated with four waste storage silos.</p> <p>The scope is defined further in these subordinate elements:</p> <table style="width: 100%;"> <tr> <td style="width: 20%;">1.1.H.A</td> <td>MANAGEMENT</td> </tr> <tr> <td>1.1.H.B</td> <td>SILO 3</td> </tr> <tr> <td>1.1.H.C</td> <td>ACCELERATED WASTE RETRIEVAL</td> </tr> <tr> <td>1.1.H.D</td> <td>SILOS 1 &amp; 2</td> </tr> </table> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>Silos Management provides for a project team responsible for managing the investigation and remediation of the Silos Project in accordance with approved cost, schedule and technical baselines. The scope includes all administrative, project controls, technical oversight, and public relations support.</p> <p>The Silo 3 scope of work includes the safe removal, stabilization, transportation and disposal of Silo 3 material to meet the WAC of an off-site disposal facility, in a safe, timely, efficient, and cost-effective manner. The treatment of the Silo 3 material will be conducted in accordance with the clean-up objectives and requirements identified in the ESD for Silo 3. The ESD</p>		1.1.H.A	MANAGEMENT	1.1.H.B	SILO 3	1.1.H.C	ACCELERATED WASTE RETRIEVAL	1.1.H.D	SILOS 1 & 2
1.1.H.A	MANAGEMENT								
1.1.H.B	SILO 3								
1.1.H.C	ACCELERATED WASTE RETRIEVAL								
1.1.H.D	SILOS 1 & 2								

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1. PROJECT TITLE  FEMP (DEFENSE)	2. DATE OF CONTRACT  12/01/2000
3. IDENTIFICATION NUMBER  DE-AC24-01OH20115	4. INDEX LINE NO.  68
5. WBS ELEMENT CODE  1.1.H	6. WBS ELEMENT TITLE  PBS 07 SILOS
7. APPROVED CP NO.  NEW PER CP# FY01-0115-0007-00	8. DATE OF CHANGES  12/01/2000
9. SYSTEM DESIGN DESCRIPTION  CERCLA / ACA	10. BUDGET AND REPORTING NUMBER  EW05H3070
11. ELEMENT TASK DESCRIPTION <p>identified chemical stabilization/solidification and polymer encapsulation as acceptable stabilization options. These stabilization options involve the mixing of Silo 3 material with a variety of chemical additive formulations to accomplish chemical and physical binding of the constituents of concern (COCs). These options provide reduction in contaminant mobility by chemically stabilizing contaminants into a leach-resistant form, as well as physically binding the chemically stabilized contaminants in a solid matrix.</p> <p>The Accelerated Waste Retrieval (AWR) Scope of Work provides for the retrieval and transfer of the material in Silos 1 and 2 to a newly constructed Transfer Tank Area (TTA) for safe interim storage pending final treatment and disposal. The project also includes construction of a Radon Control System (RCS) to provide mitigation of radon emissions from the Silos, the TTA, and from the future Silos 1 and 2 Full-scale Remediation Facility. Fluor Fernald, Inc. has placed contract No. FSC624 with Foster Wheeler Environmental Corporation (FWENC) for the design, construction, startup, testing and operation of the systems and facilities required for implementation of the AWR Project.</p> <p>Silo 1 &amp; 2 Project provides for the safe transfer of the Silos 1 and 2 material from the Transfer Tank Area (TTA), on-site treatment by a chemical stabilization process, and off-site disposal of the treated Silos 1 and 2 material at the Nevada Test Site (NTS). Included is the safe shutdown and D&amp;D of the Silos 1 and 2 treatment and support facilities, including the TTA and RCS. Also included is the D&amp;D of Silos 1,2,3 &amp; 4, the superstructures over Silos 1,2 &amp; 4, the old Radon Treatment Facility, the Silo 3 Remediation Facility, and the Vitrification Pilot Plant Facility.</p>	

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1. PROJECT TITLE  FEMP (DEFENSE)	2. DATE OF CONTRACT  12/01/2000
3. IDENTIFICATION NUMBER  DE-AC24-01OH20115	4. INDEX LINE NO.  74
5. WBS ELEMENT CODE  1.1.H.A	6. WBS ELEMENT TITLE  MANAGEMENT
7. APPROVED CP NO.  NEW PER CP# FY01-0115-0007-00	8. DATE OF CHANGES  12/01/2000
9. SYSTEM DESIGN DESCRIPTION  CERCLA / ACA	10. BUDGET AND REPORTING NUMBER  EW05H3070
11. ELEMENT TASK DESCRIPTION  <p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor ODCs Subcontractors Material</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>Silos Project Management provides for a technically qualified management team responsible for the investigation and remediation of Operable Unit 4 in accordance with approved cost, schedule, technical baseline and regulatory requirements. The Silos Project Management provides administrative support and interfaces with the site programmatic services. Provide the Silo project with the technical oversight throughout the design basis and design. The Silo's Project division will require oversight and integration support until Silo's 1 &amp; 2 Subproject readiness and startup is completed in in FY06. Silo's Division management scope remaining after FY06 is transferred to the Silo's 1 and 2 management WBS.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>Provide overall Silos Project Management to support closure of the Silos area formerly referred to as Operable Unit 4. This scope of work includes management of the Silos Project within the overall FEMP site mission and coordination with other FEMP projects. Silos Project Management provides for a project team and resources for managing the remediation of the Silos which consists of three subprojects Accelerated Waste Retrieval (AWR), Silo 3, and Silos 1 and 2 in accordance with the approved cost, schedule, and technical baseline. The Project Management overall scope is comprised of the following tasks:</p> <p>1.1.1. Project Management</p>	

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9. SYSTEM DESIGN DESCRIPTION  CERCLA / ACA	10. BUDGET AND REPORTING NUMBER  EW05H3070
11. ELEMENT TASK DESCRIPTION  <p>Silos project management provides for a technically qualified team responsible for executing the remediation of the Silos program (Operable Unit 4) which consists of three subprojects Accelerated Waste Retrieval (AWR), Silo 3, and Silos 1 and 2. The project management team provides oversight of all Silos technical programs, provides day to day Division management and interfaces with the programmatic areas. In addition, this scope will include subcontracts to provide for a Critical Analysis Team (3 members) to perform as an independent advisory panel to the DOE-FEMP. The CAT reviews technical documents, interviews Fluor Fernald staff, interacts with regulators and the public and provides written reports. The CAT will be active on the Silos Project through substantial completion of the remediation (FY-07).</p> <p>The following are additional scope elements provided for in this task:</p> <ul style="list-style-type: none"> <li>· Public Meetings lead for Silos, provide assistance in response to stakeholder inquires.</li> <li>· Insure Silos Project activities comply with all applicable safety regulations, policies, and DOE Orders, Regulatory Agreements/Regulations, etc.</li> <li>· Provide oversight of cost and schedule in accordance with baseline and Silos Project requirements.</li> <li>· Manage preparation, review and implementation of departmental procedures.</li> <li>· Insure integration with and support of site-wide programs, such as, Technology Programs, Legal Affairs, Project Controls, etc.</li> <li>- Manage the Silos Technical Program</li> <li>- Insure Silos Technical integration of Engineering and Construction Scope</li> <li>- Develop integrated plans to support the technical baseline</li> <li>- Insure controls are in place to manage the Critical Path Project of the site</li> <li>- Develop a Silos Project Execution Plan (PEP). The Silos PEP will encompass and reference lower level sub projects and replace subproject PEPs</li> <li>- Implement and Engineering, Procurement, Construction and Operations (EPCO) approach to completing the Silos project</li> </ul> <p>1.4.2. Administration</p> <p>This scope includes the management of the Silos Project administrative functions, specifically, administrative staff integration, Human Resources interface, space coordination, property management, records management, document control, procedure coordination, computer allocation, Occurrence Reporting &amp; Processing (OPR) system, commitment &amp; action item tracking, document reviews coordination, training, safety and recognition coordination. Silos administrative scope will also include the procurement of office supplies,</p>	

U.S. DEPARTMENT OF ENERGY  
WORK BREAKDOWN STRUCTURE DICTIONARY  
PART II - ELEMENT DEFINITION

1. PROJECT TITLE  FEMP (DEFENSE)	2. DATE OF CONTRACT  12/01/2000
3. IDENTIFICATION NUMBER  DE-AC24-01OH20115	4. INDEX LINE NO.  74
5. WBS ELEMENT CODE  1.1.H.A	6. WBS ELEMENT TITLE  MANAGEMENT
7. APPROVED CP NO.  NEW PER CP# FY01-0115-0007-00	8. DATE OF CHANGES  12/01/2000
9. SYSTEM DESIGN DESCRIPTION  CERCLA / ACA	10. BUDGET AND REPORTING NUMBER  EW05H3070
11. ELEMENT TASK DESCRIPTION <p>office equipment and credit card purchases. In addition, performance assessments, electronic timesheets, overtime requests, signature authorization, management distribution, organization charts, and alternate work schedules shall be monitored and managed in the administrative work scope. Provide technical writing and administrative document support during Readiness assessment, baseline development and Project Execution Plan.</p> <p>1.4.3. Environmental Compliance</p> <p>This scope is to provide environmental compliance to integrate Silos activities with site-wide environmental programs. The primary functions under this work scope are to interpret environmental regulations/requirements and to develop compliance strategies. The Environmental Compliance lead will act as the point of contact for regulatory agencies within the Silos Project. Remedial Design and Remedial Action work plans will be coordinated, issued, and comments resolved under the specific project scope of work.</p> <p>1.4.4. Project Controls</p> <p>The scope includes the general implementation of Site Project Control procedures. Coordinate the definition of project work scope and preparation of the Work Breakdown Structure. Insure all work authorization procedures are followed. Develop resource-loaded baseline schedules and a Performance Measurement Baseline (PMB). Control the PMB through the change control process. Insure all work is coordinated with Project Managers (PM) and Control Account Managers (CAM) in establishing budgets, developing and maintaining detailed plans and schedules, accumulating cost information, measuring performance against the PMB, performing variance analysis, developing forecast information, and managing funds. Provide internal cost and schedule reports and trend analysis. Maintain accurate accrual and commitment lists. Provide status for the preparation of the monthly Project Manager's Progress Report, the quarterly Integrated Planning, Accountability and Budgeting systems (IPABS) Report, the Monthly Program Status Review, the Mid-Year Review, and the Year End Review. Provide input as requested for the Site Specific Plan, and any audits. Provide cost and schedule information as requested by DOE, Silos Project departments, and Project Integration.</p> <p>1.4.5. Public Relations</p> <p>The Silos project public relations scope is to provide support to maintain</p>	

U.S. DEPARTMENT OF ENERGY  
WORK BREAKDOWN STRUCTURE DICTIONARY  
PART II - ELEMENT DEFINITION

1. PROJECT TITLE  FEMP (DEFENSE)	2. DATE OF CONTRACT  12/01/2000
3. IDENTIFICATION NUMBER  DE-AC24-01OH20115	4. INDEX LINE NO.  74
5. WBS ELEMENT CODE  1.1.H.A	6. WBS ELEMENT TITLE  MANAGEMENT
7. APPROVED CP NO.  NEW PER CP# FY01-0115-0007-00	8. DATE OF CHANGES  12/01/2000
9. SYSTEM DESIGN DESCRIPTION  CERCLA / ACA	10. BUDGET AND REPORTING NUMBER  EW05H3070
11. ELEMENT TASK DESCRIPTION <p>public involvement throughout the remediation of the Silos area (Operable Unit 4). The scope includes interfacing with and supporting the public relations group to facilitate communication activities associated with stakeholders, community, township, Citizen's Task Force, Fernald Residents for Environmental Safety and Health meetings, public meetings and workshops both at Fernald and in Nevada. The goal is to efficiently communicate and align with critical stakeholders. This subtask will be performed by the Project Manager, Deputy Project Manager, and the Environmental Compliance lead; therefore additional manpower is not required.</p> <p>1.4.6. Readiness and Assessments</p> <p>Provides for management and coordination of Silos project readiness, quality, assessments, and programmatic requirements resulting from both internal and external reviews.</p> <p>The scope of work includes management and policy development for all facets of operational readiness, ensuring that the facility and personnel are prepared to operate safely and effectively. As the Silos Project includes Hazard Category 3 facilities, ORRs are anticipated; therefore, the Silos Division management will coordinate with the Operations Assessment Program staff to ensure successful development and implementation of a Readiness Plan of Action leading to the final readiness assessments (RA, SSR, ORR).</p> <p>This scope includes the general participation, interview, program support, and program evaluation for assessments performed by both internal and external sources. The following groups are typically involved in such assessments: Critical Analysis Team, Defense Nuclear Facility Safety Board, ICE Team, DOE-HQ, National Academy of Sciences, Inspector General, Association of Toxic Substance and Disease Registry, Stakeholder Committees, Corp. of Engineers, and the GAO. Support personnel from the projects will charge to their respective projects while participating in reviews and assessments.</p> <p>In addition, this scope includes the development and management of the Silos Division programs for Quality Assurance. This will include coordinating and performing project self assessments as well as supporting the efforts of the independent QA and QC functions.</p> <p>Following completion of Silo 3 and AWR projects in FY-05 the Readiness and Assessment function will be absorbed into the Silos 1 and 2 scope of work.</p>	

**WORK SCOPE DEFINITION**  
(Control Account)

1. PROJECT TITLE  FEMP (DEFENSE)		2. DATE  12/01/2000	Page 1
3. WBS ELEMENT CODE  1.1.H.A	4. WBS ELEMENT TITLE/NAME  MANAGEMENT		
5. PERFORMING DIV/DEPARTMENT CODE  4301	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/00 - 09/06	
12. TASK IDENTIFICATION (CONTROL ACCOUNT)  HPM1	13. TASK DESCRIPTION (ONE LINE)  PROJECT MANAGEMENT		
<div>14. ELEMENT TASK DESCRIPTION</div> <div><b><u>a. ELEMENTS OF COST:</u></b></div> <div>Labor ODCs Subcontractors Material</div> <div><b><u>b. TECHNICAL CONTENT:</u></b></div> <div>Silos Project Management provides for a technically qualified management team responsible for the investigation and remediation of Operable Unit 4 in accordance with approved cost, schedule, technical baseline and regulatory requirements. The Silos Project Management provides administrative support and interfaces with the site programmatic services. Provide the Silo project with the technical oversight throughout the design basis and design. The Silo's Project division will require oversight and integration support until Silo's 1 &amp; 2 Subproject readiness and startup is completed in in FY06. Silo's Division management scope remaining after FY06 is transferred to the Silo's 1 and 2 management WBS.</div> <div><b><u>c. SCOPE OF WORK:</u></b></div> <div>Provide overall Silos Project Management to support closure of the Silos area formerly referred to as Operable Unit 4. This scope of work includes management of the Silos Project within the overall FEMP site mission and coordination with other FEMP projects. Silos Project Management provides for a project team and resources for managing the remediation of the Silos which consists of three subprojects Accelerated Waste Retrieval (AWR), Silo 3, and Silos 1 and 2 in accordance with the approved cost, schedule, and technical baseline. The Project Management overall scope is comprised of the following tasks:</div>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard Weeks</i>	

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1. PROJECT TITLE  FEMP (DEFENSE)		2. DATE  12/01/2000	Page 2
3. WBS ELEMENT CODE  1.1.H.A	4. WBS ELEMENT TITLE/NAME  MANAGEMENT		
5. PERFORMING DIV/DEPARTMENT CODE  4301	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/00 - 09/06	
12. TASK IDENTIFICATION (CONTROL ACCOUNT)  HPM1	13. TASK DESCRIPTION (ONE LINE)  PROJECT MANAGEMENT		
14. ELEMENT TASK DESCRIPTION  <p>1.1.1.1. Project Management</p> <p>Silos project management provides for a technically qualified team responsible for executing the remediation of the Silos program (Operable Unit 4) which consists of three subprojects Accelerated Waste Retrieval (AWR), Silo 3, and Silos 1 and 2. The project management team provides oversight of all Silos technical programs, provides day to day Division management and interfaces with the programmatic areas. In addition, this scope will include subcontracts to provide for a Critical Analysis Team (3 members) to perform as an independent advisory panel to the DOE-FEMP. The CAT reviews technical documents, interviews Fluor Fernald staff, interacts with regulators and the public and provides written reports. The CAT will be active on the Silos Project through substantial completion of the remediation (FY-07).</p> <p>The following are additional scope elements provided for in this task:</p> <ul style="list-style-type: none"> <li>· Public Meetings lead for Silos, provide assistance in response to stakeholder inquiries.</li> <li>· Insure Silos Project activities comply with all applicable safety regulations, policies, and DOE Orders, Regulatory Agreements/Regulations, etc.</li> <li>· Provide oversight of cost and schedule in accordance with baseline and Silos Project requirements.</li> <li>· Manage preparation, review and implementation of departmental procedures.</li> <li>· Insure integration with and support of site-wide programs, such as, Technology Programs, Legal Affairs, Project Controls, etc.</li> <li>- Manage the Silos Technical Program</li> <li>- Insure Silos Technical integration of Engineering and Construction Scope</li> <li>- Develop integrated plans to support the technical baseline</li> <li>- Insure controls are in place to manage the Critical Path Project of the site</li> <li>- Develop a Silos Project Execution Plan (PEP). The Silos PEP will encompass and reference lower level sub projects and replace subproject PEPs</li> <li>- Implement and Engineering, Procurement, Construction and Operations (EPCO) approach to completing the Silos project</li> </ul> <p>1.4.2. Administration</p> <p>This scope includes the management of the Silos Project administrative</p>			



# **WORK SCOPE DEFINITION** (Control Account)

1. PROJECT TITLE		2. DATE	
FEMP (DEFENSE)		12/01/2000	Page 3
3. WBS ELEMENT CODE	4. WBS ELEMENT TITLE/NAME		
1.1.1.H.A	MANAGEMENT		
5. PERFORMING DIV/DEPARTMENT CODE	6. ORIGINATOR NAME/PHONE	7. WBS ELEMENT MANAGER	
4301	R. FELLMAN	R. FELLMAN	
8. BUDGET AND REPORTING NUMBER	9. BUDGET TITLE		
EW05H3070	SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?		11. ESTIMATED START / COMPLETION DATE	
NEW PER CP# FY01-0115-0007-00		12/00 - 09/06	
12. TASK IDENTIFICATION (CONTROL ACCOUNT)	13. TASK DESCRIPTION (ONE LINE)		
HPM1	PROJECT MANAGEMENT		
14. ELEMENT TASK DESCRIPTION			
<p>functions, specifically, administrative staff integration, Human Resources interface, space coordination, property management, records management, document control, procedure coordination, computer allocation, Occurrence Reporting &amp; Processing (OPR) system, commitment &amp; action item tracking, document reviews coordination, training, safety and recognition coordination. Silos administrative scope will also include the procurement of office supplies, office equipment and credit card purchases. In addition, performance assessments, electronic timesheets, overtime requests, signature authorization, management distribution, organization charts, and alternate work schedules shall be monitored and managed in the administrative work scope. Provide technical writing and administrative document support during Readiness assessment, baseline development and Project Execution Plan.</p> <p>1.4.3. Environmental Compliance</p> <p>This scope is to provide environmental compliance to integrate Silos activities with site-wide environmental programs. The primary functions under this work scope are to interpret environmental regulations/requirements and to develop compliance strategies. The Environmental Compliance lead will act as the point of contact for regulatory agencies within the Silos Project. Remedial Design and Remedial Action work plans will be coordinated, issued, and comments resolved under the specific project scope of work.</p> <p>1.4.4. Project Controls</p> <p>The scope includes the general implementation of Site Project Control procedures. Coordinate the definition of project work scope and preparation of the Work Breakdown Structure. Insure all work authorization procedures are followed. Develop resource-loaded baseline schedules and a Performance Measurement Baseline (PMB). Control the PMB through the change control process. Insure all work is coordinated with Project Managers (PM) and Control Account Managers (CAM) in establishing budgets, developing and maintaining detailed plans and schedules, accumulating cost information, measuring performance against the PMB, performing variance analysis, developing forecast information, and managing funds. Provide internal cost and schedule reports and trend analysis. Maintain accurate accrual and commitment lists. Provide status for the preparation of the monthly Project Manager's Progress Report, the quarterly</p>			

**WORK SCOPE DEFINITION**  
(Control Account)

1. PROJECT TITLE  FEMP (DEFENSE)		2. DATE  12/01/2000	Page 4
3. WBS ELEMENT CODE  1.1.H.A	4. WBS ELEMENT TITLE/NAME  MANAGEMENT		
5. PERFORMING DIV/DEPARTMENT CODE  4301	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/00 - 09/06	
12. TASK IDENTIFICATION (CONTROL ACCOUNT)  HPM1	13. TASK DESCRIPTION (ONE LINE)  PROJECT MANAGEMENT		
14. ELEMENT TASK DESCRIPTION  <p>Integrated Planning, Accountability and Budgeting systems (IPABS) Report, the Monthly Program Status Review, the Mid-Year Review, and the Year End Review. Provide input as requested for the Site Specific Plan, and any audits. Provide cost and schedule information as requested by DOE, Silos Project departments, and Project Integration.</p> <p>1.4.5. Public Relations</p> <p>The Silos project public relations scope is to provide support to maintain public involvement throughout the remediation of the Silos area (Operable Unit 4). The scope includes interfacing with and supporting the public relations group to facilitate communication activities associated with stakeholders, community, township, Citizen's Task Force, Fernald Residents for Environmental Safety and Health meetings, public meetings and workshops both at Fernald and in Nevada. The goal is to efficiently communicate and align with critical stakeholders. This subtask will be performed by the Project Manager, Deputy Project Manager, and the Environmental Compliance lead; therefore additional manpower is not required.</p> <p>1.4.6. Readiness and Assessments</p> <p>Provides for management and coordination of Silos project readiness, quality, assessments, and programmatic requirements resulting from both internal and external reviews.</p> <p>The scope of work includes management and policy development for all facets of operational readiness, ensuring that the facility and personnel are prepared to operate safely and effectively. As the Silos Project includes Hazard Category 3 facilities, ORRs are anticipated; therefore, the Silos Division management will coordinate with the Operations Assessment Program staff to ensure successful development and implementation of a Readiness Plan of Action leading to the final readiness assessments (RA, SSR, ORR).</p> <p><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></p>			

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(Control Account)

1. PROJECT TITLE  FEMP (DEFENSE)		2. DATE  12/01/2000	Page 5
3. WBS ELEMENT CODE  1.1.H.A	4. WBS ELEMENT TITLE/NAME  MANAGEMENT		
5. PERFORMING DIV/DEPARTMENT CODE  4301	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/00 - 09/06	
12. TASK IDENTIFICATION (CONTROL ACCOUNT)  HPM1	13. TASK DESCRIPTION (ONE LINE)  PROJECT MANAGEMENT		
14. ELEMENT TASK DESCRIPTION  Work specifically defined in support of other WBS elements:  1.1.H.B - Silo 3 1.1.H.C - Silo 1 & 2 Waste Retrieval 1.1.H.D - Silo 1 & 2 Phase I			



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3. WBS ELEMENT CODE  1.1.H.A	4. WBS ELEMENT TITLE/NAME  MANAGEMENT		
5. PERFORMING DIV/DEPARTMENT CODE  4301	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/01 - 09/06	
12. TASK IDENTIFICATION (WORK PACKAGE)  HPM1A	13. TASK DESCRIPTION (ONE LINE)  PROJECT MANAGEMENT		
14. ELEMENT TASK DESCRIPTION  <p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Subcontractors ODCs Material</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>Silos Project Management provides for a technically qualified management team responsible for the investigation and remediation of Operable Unit 4 in accordance with approved cost, schedule, technical baseline and regulatory requirements. The Silos Project Management provides administrative support and interfaces with the site programmatic services. Provide the Silo project with the technical oversight throughout the design basis and design. The Silo's Project division will require oversight and integration support until Silo's 1 &amp; 2 Subproject readiness and startup is completed in in FY06. Silo's Division management scope remaining after FY06 is transferred to the Silo's 1 and 2 management WBS.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>Provide overall Silos Project Management to support closure of the Silos area formerly referred to as Operable Unit 4. This scope of work includes management of the Silos Project within the overall FEMP site mission and coordination with other FEMP projects. Silos Project Management provides for a project team and resources for managing the remediation of the Silos which consists of three subprojects Accelerated Waste Retrieval (AWR), Silo 3, and Silos 1 and 2 in accordance with the approved cost, schedule, and technical baseline. The Project Management overall scope is comprised of the following tasks:</p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard H. H. H.</i>	

# WORK SCOPE DEFINITION

(Work Package)

1. PROJECT TITLE  <b>FEMP (DEFENSE)</b>		2. DATE  12/01/2000	Page 2
3. WBS ELEMENT CODE  1.1.H.A	4. WBS ELEMENT TITLE/NAME  MANAGEMENT		
5. PERFORMING DIV/DEPARTMENT CODE  4301	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/01 - 09/06	
12. TASK IDENTIFICATION (WORK PACKAGE)  HPM1A	13. TASK DESCRIPTION (ONE LINE)  PROJECT MANAGEMENT		
14. ELEMENT TASK DESCRIPTION  <div style="margin-left: 20px;"> <p>1.1.1. Project Management</p> <p>Silos project management provides for a technically qualified team responsible for executing the remediation of the Silos program (Operable Unit 4) which consists of three subprojects Accelerated Waste Retrieval (AWR), Silo 3, and Silos 1 and 2. The project management team provides oversight of all Silos technical programs, provides day to day Division management and interfaces with the programmatic areas. In addition, this scope will include subcontracts to provide for a Critical Analysis Team (3 members) to perform as an independent advisory panel to the DOE-FEMP. The CAT reviews technical documents, interviews Fluor Fernald staff, interacts with regulators and the public and provides written reports. The CAT will be active on the Silos Project through substantial completion of the remediation (FY-07).</p> <p>The following are additional scope elements provided for in this task:</p> <ul style="list-style-type: none"> <li>· Public Meetings lead for Silos, provide assistance in response to stakeholder inquires.</li> <li>· Insure Silos Project activities comply with all applicable safety regulations, policies, and DOE Orders, Regulatory Agreements/Regulations, etc.</li> <li>· Provide oversight of cost and schedule in accordance with baseline and Silos Project requirements.</li> <li>· Manage preparation, review and implementation of departmental procedures.</li> <li>· Insure integration with and support of site-wide programs, such as, Technology Programs, Legal Affairs, Project Controls, etc.</li> <li>- Manage the Silos Technical Program</li> <li>- Insure Silos Technical integration of Engineering and Construction Scope</li> <li>- Develop integrated plans to support the technical baseline</li> <li>- Insure controls are in place to manage the Critical Path Project of the site</li> <li>- Develop a Silos Project Execution Plan (PEP). The Silos PEP will encompass and reference lower level sub projects and replace subproject PEPs</li> <li>- Implement and Engineering, Procurement, Construction and Operations (EPCO) approach to completing the Silos project</li> </ul> <p>1.4.2. Administration</p> <p>This scope includes the management of the Silos Project administrative</p> </div>			

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(Work Package)

1. PROJECT TITLE  FEMP (DEFENSE)		2. DATE  12/01/2000	Page 3
3. WBS ELEMENT CODE  1.1.H.A	4. WBS ELEMENT TITLE/NAME  MANAGEMENT		
5. PERFORMING DIV/DEPARTMENT CODE  4301	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/01 - 09/06	
12. TASK IDENTIFICATION (WORK PACKAGE)  HPM1A	13. TASK DESCRIPTION (ONE LINE)  PROJECT MANAGEMENT		
14. ELEMENT TASK DESCRIPTION  functions, specifically, administrative staff integration, Human Resources interface, space coordination, property management, records management, document control, procedure coordination, computer allocation, Occurrence Reporting & Processing (OPR) system, commitment & action item tracking, document reviews coordination, training, safety and recognition coordination. Silos administrative scope will also include the procurement of office supplies, office equipment and credit card purchases. In addition, performance assessments, electronic timesheets, overtime requests, signature authorization, management distribution, organization charts, and alternate work schedules shall be monitored and managed in the administrative work scope. Provide technical writing and administrative document support during Readiness assessment, baseline development and Project Execution Plan.  1.4.3. Environmental Compliance  This scope is to provide environmental compliance to integrate Silos activities with site-wide environmental programs. The primary functions under this work scope are to interpret environmental regulations/requirements and to develop compliance strategies. The Environmental Compliance lead will act as the point of contact for regulatory agencies within the Silos Project. Remedial Design and Remedial Action work plans will be coordinated, issued, and comments resolved under the specific project scope of work.  1.4.4. Project Controls  The scope includes the general implementation of Site Project Control procedures. Coordinate the definition of project work scope and preparation of the Work Breakdown Structure. Insure all work authorization procedures are followed. Develop resource-loaded baseline schedules and a Performance Measurement Baseline (PMB). Control the PMB through the change control process. Insure all work is coordinated with Project Managers (PM) and Control Account Managers (CAM) in establishing budgets, developing and maintaining detailed plans and schedules, accumulating cost information, measuring performance against the PMB, performing variance analysis, developing forecast information, and managing funds. Provide internal cost and schedule reports and trend analysis. Maintain accurate accrual and commitment lists. Provide status for the preparation of the monthly Project Manager's Progress Report, the quarterly			

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1. PROJECT TITLE  FEMP (DEFENSE)		2. DATE  12/01/2000	Page 4
3. WBS ELEMENT CODE  1.1.H.A	4. WBS ELEMENT TITLE/NAME  MANAGEMENT		
5. PERFORMING DIV/DEPARTMENT CODE  4301	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/01 - 09/06	
12. TASK IDENTIFICATION (WORK PACKAGE)  HPM1A	13. TASK DESCRIPTION (ONE LINE)  PROJECT MANAGEMENT		
14. ELEMENT TASK DESCRIPTION  <p>Integrated Planning, Accountability and Budgeting systems (IPABS) Report, the Monthly Program Status Review, the Mid-Year Review, and the Year End Review. Provide input as requested for the Site Specific Plan, and any audits. Provide cost and schedule information as requested by DOE, Silos Project departments, and Project Integration.</p> <p>1.4.5. Public Relations</p> <p>The Silos project public relations scope is to provide support to maintain public involvement throughout the remediation of the Silos area (Operable Unit 4). The scope includes interfacing with and supporting the public relations group to facilitate communication activities associated with stakeholders, community, township, Citizen's Task Force, Fernald Residents for Environmental Safety and Health meetings, public meetings and workshops both at Fernald and in Nevada. The goal is to efficiently communicate and align with critical stakeholders. This subtask will be performed by the Project Manager, Deputy Project Manager, and the Environmental Compliance lead; therefore additional manpower is not required.</p> <p>1.4.6. Readiness and Assessments</p> <p>Provides for management and coordination of Silos project readiness, quality, assessments, and programmatic requirements resulting from both internal and external reviews.</p> <p>The scope of work includes management and policy development for all facets of operational readiness, ensuring that the facility and personnel are prepared to operate safely and effectively. As the Silos Project includes Hazard Category 3 facilities, ORRs are anticipated; therefore, the Silos Division management will coordinate with the Operations Assessment Program staff to ensure successful development and implementation of a Readiness Plan of Action leading to the final readiness assessments (RA, SSR, ORR).</p> <p>This scope includes the general participation, interview, program support, and program evaluation for assessments performed by both internal and external sources. The following groups are typically involved in such assessments: Critical Analysis Team, Defense Nuclear Facility Safety Board, ICE Team, DOE-HQ,</p>			



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1. PROJECT TITLE  FEMP (DEFENSE)		2. DATE  12/01/2000	Page 5
3. WBS ELEMENT CODE  1.1.H.A	4. WBS ELEMENT TITLE/NAME  MANAGEMENT		
5. PERFORMING DIV/DEPARTMENT CODE  4301	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/01 - 09/06	
12. TASK IDENTIFICATION (WORK PACKAGE)  HPM1A	13. TASK DESCRIPTION (ONE LINE)  PROJECT MANAGEMENT		

14. ELEMENT TASK DESCRIPTION

National Academy of Sciences, Inspector General, Association of Toxic Substance and Disease Registry, Stakeholder Committees, Corp. of Engineers, and the GAO. Support personnel from the projects will charge to their respective projects while participating in reviews and assessments.

In addition, this scope includes the development and management of the Silos Division programs for Quality Assurance. This will include coordinating and performing project self assessments as well as supporting the efforts of the independent QA and QC functions.

Following completion of Silo 3 and AWR projects in FY-05 the Readiness and Assessment function will be absorbed into the Silos 1 and 2 scope of work.

**d. WORK SPECIFICALLY EXCLUDED:**

Work specifically defined in support of other WBS elements:

- 1.1.H.B - Silo 3
- 1.1.H.C - Silo 1 & 2 Waste Retrieval
- 1.1.H.D - Silo 1 & 2 Phase I



## **SECTION 1**

### **1.0 NARRATIVE**



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1. PROJECT TITLE: SILOS PROJECT	2. DATE: 09/10/01	3. PBS#: 07
4. WBS ELEMENT CODE: 1.1.H.A.	5. WBS ELEMENT TITLE: PROJECT MANAGEMENT	
6. CAM NAME/ PHONE: MIKE KUNTZ ROBERT FELLMAN/ <del>DENNIS NIXON</del>	7. CAM SIGNATURE:	
8. ORIGINAL/ CHANGE SCOPE/ PER CP#:	9. CONTROL ACCOUNT: HPM1	

## SECTION 1: HPM1 – PROJECT MANAGEMENT

### 1.0 NARRATIVE

#### 1.1 OVERVIEW

Provide overall Silos Project Management to support closure of the Silos area formerly referred to as Operable Unit 4. This scope of work includes management of the Silos Project within the overall FEMP site mission and coordination with other FEMP projects. Silos Project Management provides for a project team and resources for managing the remediation of the Silos which consists of three subprojects Accelerated Waste Retrieval (AWR), Silo 3, and Silos 1 and 2 in accordance with the approved cost, schedule, and technical baseline. The Project Management overall scope is comprised of the following tasks:

- Project Management
- Administration
- Environmental Compliance
- Project Controls
- Public Relations
- Readiness and Assessments

#### 1.2 ASSUMPTIONS/EXCLUSIONS

##### 1.2.1 Assumptions

##### 1.2.1.1 Project Management

- The Project Management scope of work is required to provide management support for the projects within the Silos Division (AWR, Silo 3, Silos 1 and 2) in addition to coordination and integration with all external projects and programs;
- There will be overall project management oversight and integration support required for the Silos Project division until the ~~final Silos division project has been completed in FY-08.~~ Silos 1 and 2 Sub Project, Readiness and Start-up will be complete in FY-06. Project Management scope remaining for Silos 1 and 2, including AWR, will be transferred to Silos 1 and 2 Management WBS.

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- Implement an Engineering, Procurement, Construction and Operations (EPCO) approach to completing the Silos Project in which Fluor Fernald, Inc. and its Teaming Partners take a direct responsibility for the work.
- The Critical Analysis Team (CAT) will be funded entirely within this charge number. The individual projects will not budget for any support beyond that planned in this account.
- The make-up of the CAT team will not change, i.e. expand beyond the three current members.

1.2.1.2 Administration

- None specifically identified.

1.2.1.3 Environmental Compliance

- None specifically identified.

1.2.1.4 Project Controls

- None specifically identified.

1.2.1.5 Public Relations

- None specifically identified.

1.2.1.6 Readiness and Assessments

- None specifically identified.

1.2.2 Exclusions

1.2.2.1 Project Management

- Detailed project management and engineering activities will be directed by the individual project leads and budgeted within the specific project.

1.2.2.2 Administration

- None specifically identified.

1.2.2.3 Environmental Compliance

- Project specific Environmental Compliance activities will be directed by the individual project leads and budgeted within the specific project.

1.2.2.4 Project Controls

- None specifically identified.

1.2.2.5 Public Relations

- Public Relations manpower is centralized; the scope under this account is to provide Project Management involvement and preparation for Public Meetings and other external stakeholder activities.

1.2.2.6 Readiness and Assessments

- None specifically identified.

1.2.3 Government Furnished Equipment/Services

- None specifically identified.

1.3 DRIVERS

1.3.1 Project Management

- The Project Management task is driven by the timely completion of all Silos Division projects (AWR, Silo 3, Silos 1 and 2).
- CAT involvement through project completion has been directed by the Department of Energy.

1.3.2 Administration

- The Administration task is driven by the timely completion of the Silo 3 and AWR projects.
- Following completion of AWR project scope in the first quarter of FY-05 all administrative activities will be budgeted by the Silos 1 and 2 Project Management account.

1.3.3 Environmental Compliance

- Following completion of AWR project scope in the first quarter of FY-05 Environmental Compliance activities are reduced to a quarter of an FTE for coordination of Critical Analysis Team activities through completion of the Silos 1 and 2 project.

#### 1.3.4 Project Controls

- Project Controls staff (Cost Analyst, Scheduler, Manager) is reduced by 50% following the completion of AWR in the first quarter of FY-05.

#### 1.3.5 Public Relations

- The Public Relations task is driven by the timely completion of all Silos Division projects (AWR, Silo 3, Silos 1 and 2).

#### 1.3.6 Readiness and Assessments

- None specifically identified.

#### 1.3.7 General

- The completion of the Silos Division projects by Fiscal Year 2008 drives the completion of the overall Project Management scope.
- Delays in the Silos critical path will have day for day impact on all Project Management tasks.

### 1.4 PROJECT PLAN/TECHNICAL SCOPE AND QUANTIFICATION

#### 1.4.1 HPM1A – Project Management

Provide overall Silos project management, administration, oversight and integration both internal and external to the Division. Manage the Silos project approved cost, schedule, technical baseline, and regulatory requirements. Establish and implement programmatic requirements for the Division.

The manpower required to perform the scope of work within the Project Management activities is outlined in the following tasks. The materials and other direct costs are outlined in Table 1.0. ~~Following the first quarter of Fy 05 Silo 3 and AWR Projects are complete and Silos 1 and 2 Project continues until Fy 08 supported by a reduced Project Management staff. The scope of work for the Project Management tasks are as follows:~~ Following the third quarter of FY-05, sub-project operations will be complete supporting a reduced Project Management staff. In the third quarter of FY-06, Start-up and Readiness will be complete for Silos 1 and 2 Sub Project and Advanced Waste Retrieval Sub Project Operations will be complete. The Silos Project Management Scope and reduced resources will be transferred to Silos 1 and 2 Sub Project Management WBS.

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1) Task #1 - Project Management

1)1 Plan/Scope – Project Management

Silos project management provides for a technically qualified team responsible for executing the remediation of the Silos program (Operable Unit 4) which consists of three subprojects Accelerated Waste Retrieval (AWR), Silo 3, and Silos 1 and 2. The project management team provides oversight of all Silos technical programs, provides day to day Division management and interfaces with the programmatic areas. In addition, this scope will include subcontracts to provide for a Critical Analysis Team (3 members) to perform as an independent advisory panel to the DOE-FEMP. The CAT reviews technical documents, interviews Fluor Fernald staff, interacts with regulators and the public and provides written reports. The CAT will be active on the Silos Project through substantial completion of the remediation (FY-07).

The following are additional scope elements provided for in this task:

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- Manage the Silos Technical Program
- Insure Silos Technical integration of Engineering & Construction scope
- Develop integrated plans to support technical baseline

- Public Meetings lead for Silos, provide assistance in response to stakeholder inquires.
- Insure Silos Project activities comply with all applicable safety regulations, policies, and DOE Orders, Regulatory Agreements/Regulations, etc.

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- Insure controls are in place to manage the Critical Path Project of the site.
- Provide oversight of cost and schedule in accordance with baseline and Silos Project requirements.
- Manage preparation, review and implementation of departmental procedures.

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- Insure integration with and support of site-wide programs, such as, Technology Programs, Legal Affairs, Project Controls, etc.

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- Develop a Silos Project Execution Plan (PEP). The Silos PEP will encompass and reference lower level sub projects and replace subproject PEPs.
- Implement an Engineering, Procurement, Construction and Operations (EPCO) approach to completing the Silos Project.

1)2 Quantification – Project Management

Table 1.4-1  
Project Management - Manpower Requirements

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Resource Code	FY-01	FY-02	FY-03	FY-04	FY-05	FY-06	FY-07	FY-08
Project Manager/Deputy	2.0	2.0	2.0	2.0	<del>1.0</del> 2.0	<del>1.0</del> 1.75	<del>1.0</del> 0	<del>1.0</del> 0
Technical Project Manager	1.0	1.0	1.0	1.0	1.0	.75	0	0
Secretaries	<del>1.0</del> 2.0	<del>1.0</del> 2.0	<del>1.0</del> 2.0	1.0	1.0	<del>1.0</del> .75	<del>1.0</del> 0	<del>1.0</del> 0

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Table 1.4-2  
Critical Analysis Team - Subcontract

Description	FY-01	FY-02	FY-03	FY-04	FY-05	FY-06	FY-07	FY-08
Labor @ \$150/hour	\$180K	\$180K	\$180K	\$180K	\$81K	<del>\$81K</del> \$61K	<del>\$81K</del> 0	<del>\$0K</del> 0
Travel based on 2 trips @ \$2,500 and 1 trip @ \$3,000 for 3 CAT members	\$63K	\$63K	\$63K	\$63K	\$24K	<del>\$24K</del> \$18K	<del>\$24K</del> 0	<del>\$0K</del> 0

2) Task #2 - Administration

2)1 Plan/Scope – Administration

This scope includes the management of the Silos Project administrative functions, specifically, administrative staff integration, Human Resources interface, space coordination, property management, records management, document control, procedure coordination, computer allocation, Occurrence Reporting and Processing (OPR) system, commitment and action item tracking, document reviews coordination, training, safety and recognition coordination. Silos administrative scope will also include the procurement of office supplies, office equipment and credit card purchases. In addition, performance assessments, electronic timesheets, overtime requests, signature authorization, management distribution, organization charts, and alternate work schedules shall be monitored and managed in the administrative work scope. Provide technical writing and administrative document support during Readiness & Assessment, baseline development, and Project Execution Plan.

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## 2)2 Quantification – Administration

Table 1.4-3  
Administration - Manpower Requirements

Resource Code	FY-01	FY-02	FY-03	FY-04	FY-05	FY-06	FY-07	FY-08
Administration Manager	1.0	1.0	1.0	1.0	<del>0.5</del> 1.0	<del>0.5</del> .75	<del>0.5</del> 0	<del>0.5</del> 0
Technical/Program Support Representative	<del>1.0</del> 1.25	<del>1.0</del> 2.0	<del>1.0</del> 2.0	<del>1.0</del> 2.0	<del>0.5</del> 2.0	<del>0.5</del> 1.5	<del>0.5</del> 0	<del>0.5</del> 0
Clerk	<del>1.0</del> 2.0	<del>1.0</del> 2.0	<del>1.0</del> 2.0	<del>1.0</del> 1.0	<del>0.5</del> 1.0	<del>0.5</del> .75	<del>0.5</del> 0	<del>0.5</del> 0

## 3) Task #3 - Environmental Compliance

### 3)1 Plan/Scope – Environmental Compliance

This scope is to provide environmental compliance to integrate Silos activities with site-wide environmental programs. The primary functions under this work scope are to interpret environmental regulations/requirements and to develop compliance strategies.

The Environmental Compliance lead will act as the point of contact for regulatory agencies within the Silos Project. Remedial Design and Remedial Action work plans will be coordinated, issued, and comments resolved under the specific project scope of work.

### 3)2 Quantification – Environmental Compliance

Table 1.4-4  
Environmental Compliance - Manpower Requirements

Resource Code	FY-01	FY-02	FY-03	FY-04	FY-05	FY-06	FY-07	FY-08
Technical/Program Support Representative	<del>0.5</del> 0.6	<del>0.5</del> 0.2	<del>0.5</del> 0.4	<del>0.5</del> 0.4	<del>0.25</del> 0.4	<del>0.25</del> 0.3	<del>0.25</del> 0	<del>0.25</del> 0

## 4) Task #4 - Project Controls

### 4)1 Plan/Scope – Project Controls

The scope includes the general implementation of Site Project Control procedures. Coordinate the definition of project work scope and preparation of the Work Breakdown Structure. Insure all work authorization procedures are followed. Develop resource-loaded baseline schedules and a Performance Measurement Baseline (PMB). Control the PMB through the change control process. Insure all work is coordinated with Project Managers (PM) and Control Account Managers (CAM) in establishing budgets, developing and maintaining detailed plans and schedules, accumulating cost information, measuring performance against the PMB, performing variance analysis, developing forecast information, and managing funds. Provide internal cost and schedule reports and trend

analysis. Maintain accurate accrual and commitment lists. Provide status for the preparation of the monthly Project Manager's Progress Report, the quarterly Integrated Planning, Accountability and Budgeting systems (IPABS) Report, the Monthly Program Status Review, the Mid-Year Review, and the Year End Review. Provide input as requested for the Site Specific Plan, and any audits. Provide cost and schedule information as requested by DOE, Silos Project departments, and Project Integration.

#### 4)2 Quantification – Project Controls

Table 1.4-5  
Project Controls - Manpower Requirements

Resource Code	FY-01	FY-02	FY-03	FY-04	FY-05	FY-06	FY-07	FY-08
Cost Analyst	2.0	2.0	2.0	2.0	<del>1.0</del> 1.75	<del>1.0</del> 1.75	1.0 0	1.0 0
Project Controls Manager	1.0	1.0	1.0	1.0	<del>0.5</del> .75	<del>0.5</del> 0	<del>0.5</del> 0	<del>0.5</del> 0
Scheduler	2.0	2.0	2.0	2.0	<del>1.0</del> 1.75	<del>1.0</del> 1.75	<del>1.0</del> 0	<del>1.0</del> 0

#### 5) Task #5 - Public Relations

##### 5)1 Plan/Scope – Public Relations

The Silos project public relations scope is to provide support to maintain public involvement throughout the remediation of the Silos area (Operable Unit 4). The scope includes interfacing with and supporting the public relations group to facilitate communication activities associated with stakeholders, community, township, Citizen's Task Force, Fernald Residents for Environmental Safety and Health meetings, public meetings and workshops both at Fernald and in Nevada. The goal is to efficiently communicate and align with critical stakeholders.

##### 5)2 Quantification – Public Relations

This subtask will be performed by the Project Manager, Deputy Project Manager, and the Environmental Compliance lead; therefore additional manpower is not required.

#### 6) Task #6 - Readiness and Assessments

##### 6)1 Plan/Scope – Readiness and Assessments

Provides for management and coordination of Silos project readiness, quality, assessments, and programmatic requirements resulting from both internal and external reviews.

The scope of work includes management and policy development for all facets of operational readiness, ensuring that the facility and personnel are prepared to operate

safely and effectively. As the Silos Project includes Hazard Category 3 facilities, ORRs are anticipated; therefore, the Silos Division management will coordinate with the Operations Assessment Program staff to ensure successful development and implementation of a Readiness Plan of Action leading to the final readiness assessments (RA, SSR, ORR).

This scope includes the general participation, interview, program support, and program evaluation for assessments performed by both internal and external sources. The following groups are typically involved in such assessments: Critical Analysis Team, Defense Nuclear Facility Safety Board, ICE Team, DOE-HQ, National Academy of Sciences, Inspector General, Association of Toxic Substance and Disease Registry, Stakeholder Committees, Corp. of Engineers, and the GAO. Support personnel from the projects will charge to their respective projects while participating in reviews and assessments.

In addition, this scope includes the development and management of the Silos Division programs for Quality Assurance. This will include coordinating and performing project self assessments as well as supporting the efforts of the independent QA and QC functions.

Following completion of Silo 3 and AWR projects in FY-05 the Readiness and Assessment function will be absorbed into the Silos 1 and 2 scope of work.

#### 6)2 Quantification – Readiness and Assessments

Table 1.4-6  
Readiness and Assessments - Manpower Requirements

Resource Code	FY-01	FY-02	FY-03	FY-04	FY-05	FY-06	FY-07	FY-08
Technical Program	<del>2.0</del>	<del>2.0</del>	<del>2.0</del>	<del>2.0</del>	<del>0</del>	<del>0</del>	0	0
Support Managers	<del>0.3</del>	<del>0.3</del>	<del>0.3</del>	<del>0.3</del>	<del>0.3</del>	<del>0.2</del>		

#### 7) Task #7 – Procurement Manager

##### 7)1 Plan/Scope – Procurement Management

Silos Sub Projects Procurement and contract management scope will increase from FY02 through FY-04. Silos 1 & 2, Silo 3, and AWR Sub Projects equipment and installation contracts, will require additional procurement management resources greater than those defined in each project.

Table 1.4-7  
Procurement Management

Resource Code	FY-01	FY-02	FY-03	FY-04	FY-05	FY-06	FY-07	FY-08
Purchasing Manager	0	1.0	1.0	1.0	0	0	0	0

The materials and other direct costs required to perform the scope of work for all Project Management tasks ~~(#1-6)~~ (#1-7) is outlined in the following Table:

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Table 1.4.8

~~Table 1.4.7~~

Materials and Other Direct Costs

Item	Basis	Cost
Office Supplies & Equipment	FY-00 Actuals	\$30,000 / Year / FY-01 through <del>FY-08</del> FY06
Memberships	5 / Year @ \$200 ea.	\$ 1,000 / Year / FY-01 through <del>FY-08</del> FY-06
Meetings and Conferences	FY-00 Actuals	\$ 4,000 / Year / FY-01 through <del>FY-08</del> FY-06
Travel	Six Trips / Year Various Locations	\$12,800 / Year / FY-01 through <del>FY-08</del> FY-06
Relocation	Finance Guidance	\$60,000 / Relocation One / Year - FY- 02,03,04
Registration Fees	FY-00 Actuals	\$ 2,500 / Year / FY-01 through <del>FY-08</del> FY-06

## **SECTION 1**

### **2.0 Manpower Plans**





## Manpower Planning Sheet (CR2)

MPS #	1HA01	MANAGEMENT
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MPS #	1HA01	MANAGEMENT
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DRIVERS	START DATE	END DATE	FY 2007				FY 2008				FY 2009				FY 2010				FY 2011																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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## **SECTION 1**

### **3.0 ESTIMATE**



**HPM1A**

**MANAGEMENT**





# Fluor Fernald, Inc.

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DATE: 5-Sep-01

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Mike Kuntz

COMMENTS: F07-032, F07-034

FISCAL YEAR: FY01 - FY06

Resource:	ADMNMR	ADMINISTRATIVE MGR	EOC:	LABOR	
Res Dept:	943	Overtime:	SAL	Class:	
Yr Hours:	Oct 00- Sep 01 1,452.0	Oct 01- Sep 02 1,747.0	Oct 02- Sep 03 1,747.0	Oct 03- Sep 04 1,747.0	Oct 04- Sep 05 1,747.0
Cum Hours:	1,452.0	3,199.0	4,946.0	6,693.0	8,440.0
Yr Total Cost:	73,123	92,605	98,087	103,870	110,028
Cum Total Cost:	73,123	165,728	263,815	367,685	477,713
				563,236	563,236

Resource:	CLERKS	CLERKS	EOC:	LABOR	
Res Dept:	943	Overtime:	SAL	Class:	
Yr Hours:	Oct 00- Sep 01 2,904.0	Oct 01- Sep 02 3,494.0	Oct 02- Sep 03 3,494.0	Oct 03- Sep 04 1,747.0	Oct 04- Sep 05 1,747.0
Cum Hours:	2,904.0	6,398.0	9,892.0	11,639.0	13,386.0
Yr Total Cost:	69,377	87,861	93,062	49,274	52,195
Cum Total Cost:	69,377	157,237	250,299	299,574	351,769
				392,340	392,340

Resource:	CSTANL	COST ANALYST	EOC:	LABOR	
Res Dept:	943	Overtime:	SAL	Class:	
Yr Hours:	Oct 00- Sep 01 2,904.0	Oct 01- Sep 02 3,494.0	Oct 02- Sep 03 3,494.0	Oct 03- Sep 04 3,494.0	Oct 04- Sep 05 3,017.0
Cum Hours:	2,904.0	6,398.0	9,892.0	13,386.0	16,403.0
Yr Total Cost:	112,966	143,063	151,532	160,467	146,774
Cum Total Cost:	112,966	256,029	407,561	568,028	714,802
				780,863	780,863

Resource:	MAT300	MATERIAL OBJCLASS300	EOC:	MATERIAL	
Res Dept:	943	Overtime:	MAT	Class:	
Yr Units:	Oct 00- Sep 01 30,000.0	Oct 01- Sep 02 30,000.0	Oct 02- Sep 03 30,000.0	Oct 03- Sep 04 30,000.0	Oct 04- Sep 05 30,000.0
Cum Units:	30,000.0	60,000.0	90,000.0	120,000.0	150,000.0
Yr Total Cost:	30,000	30,810	31,642	32,528	33,439
Cum Total Cost:	30,000	60,810	92,452	124,980	158,418
				185,372	185,372

Resource:	ODC700	ODC 700	EOC:	ODC	
Res Dept:	943	Overtime:	ODC	Class:	
Yr Units:	Oct 00- Sep 01 30,000.0	Oct 01- Sep 02 30,000.0	Oct 02- Sep 03 30,000.0	Oct 03- Sep 04 30,000.0	Oct 04- Sep 05 30,000.0
Cum Units:	30,000.0	60,000.0	90,000.0	120,000.0	150,000.0
Yr Total Cost:	30,000	30,810	31,642	32,528	33,439
Cum Total Cost:	30,000	60,810	92,452	124,980	158,418
				185,372	185,372

Yr Units:	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Cum Units:	7,500.0	67,500.0	67,500.0	67,500.0	7,500.0	5,875.0	223,375.0	0.0	0.0	0.0
Yr Total Cost:	7,500	75,000.0	142,500.0	210,000.0	217,500.0	223,375.0	223,375.0	223,375.0	223,375.0	223,375.0
Cum Total Cost:	7,500	69,323	71,194	73,188	8,360	6,738	0	0	0	0
	7,500	76,823	148,017	221,204	229,564	236,302	236,302	236,302	236,302	236,302

Resource:	ODCTRL	TRAVEL RESOURCE	EOC:	ODC
Res Dept:	943	Overtime:	Class:	ODC

Yr Units:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Cum Units:	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Total Cost:	12,800.0	12,800.0	12,800.0	12,800.0	12,800.0	9,600.0	0.0	0.0	0.0	0.0
Cum Total Cost:	12,800	25,600.0	38,400.0	51,200.0	64,000.0	73,600.0	73,600.0	73,600.0	73,600.0	73,600.0
	12,800	13,146	13,501	13,879	14,267	11,011	0	0	0	0
	12,800	25,946	39,446	53,325	67,592	78,602	78,602	78,602	78,602	78,602

Resource:	PJCMGR	PROJECT CONTROLS MGR	EOC:	LABOR
Res Dept:	943	Overtime:	Class:	SAL

Yr Hours:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Cum Hours:	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Total Cost:	1,452.0	1,747.0	1,747.0	1,747.0	1,270.0	0.0	0.0	0.0	0.0	0.0
Cum Total Cost:	1,452.0	3,199.0	4,946.0	6,693.0	7,963.0	7,963.0	7,963.0	7,963.0	7,963.0	7,963.0
	95,004	120,316	127,439	134,953	103,921	0	0	0	0	0
	95,004	215,321	342,760	477,713	581,634	581,634	581,634	581,634	581,634	581,634

Resource:	PJCSCH	SCHEDULERS	EOC:	LABOR
Res Dept:	943	Overtime:	Class:	SAL

Yr Hours:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Cum Hours:	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Total Cost:	2,904.0	3,494.0	3,494.0	3,494.0	3,017.0	1,271.0	0.0	0.0	0.0	0.0
Cum Total Cost:	2,904.0	6,398.0	9,892.0	13,386.0	16,403.0	17,674.0	17,674.0	17,674.0	17,674.0	17,674.0
	153,564	194,478	205,991	218,136	199,522	89,803	0	0	0	0
	153,564	348,041	554,032	772,168	971,689	1,061,492	1,061,492	1,061,492	1,061,492	1,061,492

Resource:	PRJMGR	PROJECT MANAGER	EOC:	LABOR
Res Dept:	943	Overtime:	Class:	SAL

Yr Hours:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Cum Hours:	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Total Cost:	3,787.0	5,241.0	5,241.0	5,241.0	5,241.0	3,813.0	0.0	0.0	0.0	0.0
Cum Total Cost:	3,787.0	9,028.0	14,269.0	19,510.0	24,751.0	28,564.0	28,564.0	28,564.0	28,564.0	28,564.0
	337,649	491,858	520,976	551,692	584,397	454,245	0	0	0	0
	337,649	829,506	1,350,482	1,902,174	2,486,571	2,940,816	2,940,816	2,940,816	2,940,816	2,940,816

Resource:	PURMGR	PROC & CONTRACT MGR	EOC:	LABOR
Res Dept:	943	Overtime:	Class:	SAL

Yr Hours:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Cum Hours:	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Total Cost:	442.0	1,747.0	1,747.0	1,747.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Total Cost:	442.0	1,747.0	1,747.0	1,747.0	0.0	0.0	0.0	0.0	0.0	0.0

Resource: SECRET  
Res Dept: 943

Cum Hours: 442.0  
Yr Total Cost: 27,979  
Cum Total Cost: 27,979

Resource: SECRET  
Res Dept: 943

OverTime: 27,979

Resource: SECRET  
Res Dept: 943

OverTime: 27,979

Yr Hours: 2,335.0  
Cum Hours: 2,335.0  
Yr Total Cost: 52,141  
Cum Total Cost: 52,141

Resource: SERVSUB  
Res Dept: 943

OverTime: 243,000

Resource: SERVSUB  
Res Dept: 943

OverTime: 243,000

Yr Units: 243,000  
Cum Units: 243,000  
Yr Total Cost: 243,000  
Cum Total Cost: 243,000

Resource: TPSPMGR  
Res Dept: 943

OverTime: 16,540

Resource: TPSPMGR  
Res Dept: 943

OverTime: 16,540

Yr Hours: 264.9  
Cum Hours: 264.9  
Yr Total Cost: 16,540  
Cum Total Cost: 16,540

Resource: TPSREP  
Res Dept: 943

OverTime: 143,680

Resource: TPSREP  
Res Dept: 943

OverTime: 143,680

Yr Hours: 2,765.2  
Cum Hours: 2,765.2  
Yr Total Cost: 143,680  
Cum Total Cost: 143,680

## GRAND TOTALS:

Yr Hours: 21,210.1  
Cum Hours: 21,210.1  
Yr Total Cost: 1,375,321  
Cum Total Cost: 1,375,321

Resource: SECRET  
Res Dept: 943

OverTime: 27,979

Resource: SECRET  
Res Dept: 943

OverTime: 27,979

Yr Hours: 2,335.0  
Cum Hours: 2,335.0  
Yr Total Cost: 52,141  
Cum Total Cost: 52,141

Resource: SERVSUB  
Res Dept: 943

OverTime: 243,000

Resource: SERVSUB  
Res Dept: 943

OverTime: 243,000

Yr Units: 243,000  
Cum Units: 243,000  
Yr Total Cost: 243,000  
Cum Total Cost: 243,000

Resource: TPSPMGR  
Res Dept: 943

OverTime: 16,540

Resource: TPSPMGR  
Res Dept: 943

OverTime: 16,540

Yr Hours: 264.9  
Cum Hours: 264.9  
Yr Total Cost: 16,540  
Cum Total Cost: 16,540

Resource: TPSREP  
Res Dept: 943

OverTime: 143,680

Resource: TPSREP  
Res Dept: 943

OverTime: 143,680

Yr Hours: 2,765.2  
Cum Hours: 2,765.2  
Yr Total Cost: 143,680  
Cum Total Cost: 143,680

## GRAND TOTALS:

Yr Hours: 21,210.1  
Cum Hours: 21,210.1  
Yr Total Cost: 1,375,321  
Cum Total Cost: 1,375,321

Resource: SECRET  
Res Dept: 943

OverTime: 27,979

Resource: SECRET  
Res Dept: 943

OverTime: 27,979

Yr Hours: 2,335.0  
Cum Hours: 2,335.0  
Yr Total Cost: 52,141  
Cum Total Cost: 52,141

Resource: SERVSUB  
Res Dept: 943

OverTime: 243,000

Resource: SERVSUB  
Res Dept: 943

OverTime: 243,000

Yr Units: 243,000  
Cum Units: 243,000  
Yr Total Cost: 243,000  
Cum Total Cost: 243,000

Resource: TPSPMGR  
Res Dept: 943

OverTime: 16,540

Resource: TPSPMGR  
Res Dept: 943

OverTime: 16,540

Yr Hours: 264.9  
Cum Hours: 264.9  
Yr Total Cost: 16,540  
Cum Total Cost: 16,540

Resource: TPSREP  
Res Dept: 943

OverTime: 143,680

Resource: TPSREP  
Res Dept: 943

OverTime: 143,680

Yr Hours: 2,765.2  
Cum Hours: 2,765.2  
Yr Total Cost: 143,680  
Cum Total Cost: 143,680

## GRAND TOTALS:

Yr Hours: 21,210.1  
Cum Hours: 21,210.1  
Yr Total Cost: 1,375,321  
Cum Total Cost: 1,375,321

Robert Fellman

CAM

REVIEW TEAM

CONTROL TEAM

*[Signature]*





**WBS DICTIONARY**  
**CONTROL ACCOUNT/CHARGE NUMBER**








U.S. DEPARTMENT OF ENERGY  
WORK BREAKDOWN STRUCTURE DICTIONARY  
PART II - ELEMENT DEFINITION

1. PROJECT TITLE  FEMP (DEFENSE)	2. DATE OF CONTRACT  12/01/2000
3. IDENTIFICATION NUMBER  DE-AC24-01OH20115	4. INDEX LINE NO.  75
5. WBS ELEMENT CODE  1.1.H.B	6. WBS ELEMENT TITLE  SILOS 3
7. APPROVED CP NO.  NEW PER CP# FY01-0115-0007-00	8. DATE OF CHANGES  12/01/2000
9. SYSTEM DESIGN DESCRIPTION  CERCLA / ACA	10. BUDGET AND REPORTING NUMBER  EW05H3070
<p>11. ELEMENT TASK DESCRIPTION</p> <p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Material ODCs Subcontractors</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>The overall objective for this project is the safe removal, stabilization, transportation and disposal of Silo 3 material to meet the WAC of an off-site disposal facility, in a safe, timely, efficient, and cost-effective manner. The treatment of the Silo 3 material will be conducted in accordance with the clean-up objectives and requirements identified in the ESD for Silo 3. The ESD identified chemical stabilization/solidification and polymer encapsulation as acceptable stabilization options.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>The stabilization options involve the mixing of Silo 3 material with a variety of chemical additive formulations to accomplish chemical and physical binding of the constituents of concern (COCs). These options provide reduction in contaminant mobility by chemically stabilizing contaminants into a leach-resistant form, as well as physically binding the chemically stabilized contaminants in a solid matrix.</p> <p>Silo 3, which is a component of OU4, contains an estimated 5,088 yd3 of metal oxide material generated from the operation of the former Feed Materials Production Center, now known as the FEMP. The predominant radionuclide of concern identified within the material is Th-230, a radionuclide produced from the natural decay of uranium-238 (U-238). Silo 3 material is classified as 11(e) (2) by-product material under the AEA of 1954, as amended, and contains</p>	

U.S. DEPARTMENT OF ENERGY  
WORK BREAKDOWN STRUCTURE DICTIONARY  
PART II - ELEMENT DEFINITION

1. PROJECT TITLE  FEMP (DEFENSE)	2. DATE OF CONTRACT  12/01/2000		
3. IDENTIFICATION NUMBER  DE-AC24-01OH20115			4. INDEX LINE NO.  75
5. WBS ELEMENT CODE  1.1.H.B	6. WBS ELEMENT TITLE  SILOS 3		
7. APPROVED CP NO.  NEW PER CP# FY01-0115-0007-00			8. DATE OF CHANGES  12/01/2000
9. SYSTEM DESIGN DESCRIPTION  CERCLA / ACA	10. BUDGET AND REPORTING NUMBER  EW05H3070		
11. ELEMENT TASK DESCRIPTION several RCRA metals. The ROD established that some RCRA requirements are relevant and appropriate for management and remediation of the waste. However, Silo 3 material is exempt from regulation under RCRA due to its classification as 11(e) (2) by-product material.			

**WORK SCOPE DEFINITION**  
(Control Account)

1. PROJECT TITLE  FEMP (DEFENSE)		2. DATE  12/01/2000	Page 1
3. WBS ELEMENT CODE  1.1.H.B	4. WBS ELEMENT TITLE/NAME  SILOS 3		
5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/00 - 02/05	
12. TASK IDENTIFICATION (CONTROL ACCOUNT)  HS3A	13. TASK DESCRIPTION (ONE LINE)  SILOS 3 PROJECT		
<div>14. ELEMENT TASK DESCRIPTION</div> <div style="margin-top: 20px;"><b><u>a. ELEMENTS OF COST:</u></b></div> <div style="margin-top: 20px;">Labor ODCs Subcontractors Material</div> <div style="margin-top: 20px;"><b><u>b. TECHNICAL CONTENT:</u></b></div> <div style="margin-top: 20px;">Activities required to conduct the remediation of Silo 3 waste including removal and stabilization of Silo 3 waste, packaging, transportation and disposal of treated waste, removal of treatment equipment, and documentation.</div> <div style="margin-top: 20px;"><b><u>c. SCOPE OF WORK:</u></b></div> <div style="margin-top: 20px;">The overall objective for this project is the safe removal, stabilization, transportation and disposal of Silo 3 material to meet the WAC of an off-site disposal facility, in a safe, timely, efficient, and cost-effective manner. The treatment of the Silo 3 material will be conducted in accordance with the clean-up objectives and requirements identified in the ESD for Silo 3. The ESD identified chemical stabilization/solidification and polymer encapsulation as acceptable stabilization options.</div> <div style="margin-top: 20px;">These stabilization options involve the mixing of Silo 3 material with a variety of chemical additive formulations to accomplish chemical and physical binding of the constituents of concern (COCs). These options provide reduction in contaminant mobility by chemically stabilizing contaminants into a leach-resistant form, as well as physically binding the chemically stabilized contaminants in a solid matrix.</div>			
Project Manager 	Control Account Manager 	Control Team Manager 	

**WORK SCOPE DEFINITION**  
(Control Account)

1. PROJECT TITLE  FEMP (DEFENSE)		2. DATE  12/01/2000	Page 2
3. WBS ELEMENT CODE  1.1.H.B	4. WBS ELEMENT TITLE/NAME  SILOS 3		
5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/00 - 02/05	
12. TASK IDENTIFICATION (CONTROL ACCOUNT)  HS3A	13. TASK DESCRIPTION (ONE LINE)  SILOS 3 PROJECT		
14. ELEMENT TASK DESCRIPTION  <p>Silo 3, which is a component of OU4, contains an estimated 5,088 yd3 of metal oxide material generated from the operation of the former Feed Materials Production Center, now known as the FEMP. The predominant radionuclide of concern identified within the material is Th-230, a radionuclide produced from the natural decay of uranium-238 (U-238). Silo 3 material is classified as 11(e) (2) by-product material under the AEA of 1954, as amended, and contains several RCRA metals. The ROD established that some RCRA requirements are relevant and appropriate for management and remediation of the waste. However, Silo 3 material is exempt from regulation under RCRA due to its classification as 11(e) (2) by-product material.</p> <p>In addition to the remediation of the Silo 3 material, the project also consists of the safe shutdown of the Silo 3 structures. The object of safe shutdown will be to place the facilities in a controlled state ready for dismantlement.</p> <p><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></p> <p>OU4 Soil Remediation Silo 3 Dismantlement Silo 3 Treatment Facility Dismantlement</p>			

**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE  FEMP (DEFENSE)		2. DATE  12/01/2000	Page 1
3. WBS ELEMENT CODE  1.1.H.B	4. WBS ELEMENT TITLE/NAME  SILOS 3		
5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/00 - 03/05	
12. TASK IDENTIFICATION (WORK PACKAGE)  HS3AA	13. TASK DESCRIPTION (ONE LINE)  PROJECT MANAGEMENT		
<p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Subcontractors ODCs Material</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>Activities required by Fluor Fernald to manage the Silo 3 Project</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>The scope of the project management task consists of those project-related activities which are needed to support the implementation of the Silo 3 Project, and the documentation required, under the terms of the Site Closure Contract, to demonstrate the ability to execute the Silo 3 Project. The Project Management scope of work is defined by three project subtasks to be conducted by Fluor Fernald:</p> <ul style="list-style-type: none"><li>1.4.1.1 Project Management</li><li>1.4.1.2 Project Management Documentation</li><li>1.4.1.3 Project Closure</li></ul> <p><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></p> <p>None</p>			
Project Manager <i>Robert Fellman</i>		Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard P. Harkins</i>



**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE  FEMP (DEFENSE)		2. DATE  12/01/2000	Page 1
3. WBS ELEMENT CODE  1.1.H.B	4. WBS ELEMENT TITLE/NAME  SILOS 3		
5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  06/01 - 12/03	
12. TASK IDENTIFICATION (WORK PACKAGE)  HS3AB	13. TASK DESCRIPTION (ONE LINE)  DESIGN DOCUMENTATION		
<p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Subcontractors ODCs Material</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>The activities of Remedial Design consists of development of technical, safety and regulatory documentation that is necessary to support design of the Silo 3 treatment process and facilities.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>Remedial Design will be conducted primarily by a Fluor Fernald Silos Team, which consists of site personnel and team members from DFS and Jacobs. Independent consultants, specialty subcontractors, and university subcontractors will be utilized as needed. Configuration management activities during Title III engineering are also included in the Remedial Design scope. The Remedial Design includes the following subtasks:</p> <p>Design Data Development Remedial Design Package Preliminary Hazard Analysis Report Health and Safety Plan/Health and Safety Requirements Matrix</p> <p><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></p>			
Project Manager <i>Robert Fellman</i>		Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Robert Fellman</i>

**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE  <b>FEMP (DEFENSE)</b>		2. DATE  <b>12/01/2000</b>	Page 2
3. WBS ELEMENT CODE  <b>1.1.H.B</b>	4. WBS ELEMENT TITLE/NAME  <b>SILOS 3</b>		
5. PERFORMING DIV/DEPARTMENT CODE  <b>4304</b>	6. ORIGINATOR NAME/PHONE  <b>R. FELLMAN</b>	7. WBS ELEMENT MANAGER  <b>R. FELLMAN</b>	
8. BUDGET AND REPORTING NUMBER  <b>EW05H3070</b>	9. BUDGET TITLE  <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE  <b>06/01 - 12/03</b>	
12. TASK IDENTIFICATION (WORK PACKAGE)  <b>HS3AB</b>	13. TASK DESCRIPTION (ONE LINE)  <b>DESIGN DOCUMENTATION</b>		
14. ELEMENT TASK DESCRIPTION  <b>Conceptual, preliminary and final design work</b>			



**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE  FEMP (DEFENSE)		2. DATE  12/01/2000	Page 1
3. WBS ELEMENT CODE  1.1.H.B	4. WBS ELEMENT TITLE/NAME  SILOS 3		
5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  11/01 - 12-03	
12. TASK IDENTIFICATION (WORK PACKAGE)  HS3AC	13. TASK DESCRIPTION (ONE LINE)  CONSTRUCTION MANAGEMENT		

<p>14. ELEMENT TASK DESCRIPTION</p> <p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Material ODCs Subcontractors</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>Construction Management consists of the activities necessary to support construction, including equipment procurement, reviews, infrastructure coordination, planning and bidding support, subcontract oversight, and acceptance testing.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>Fluor Fernald will act as the general contractor for construction of the Silo 3 remediation facility. The design and specifications of the construction scope will be divided into logical bid packages by discipline (i.e., civil, mechanical, and electrical). Fixed price contracts will be secured. Construction Management consists of the following key subtasks:</p> <p>Equipment Procurement Invitation for Bid Preparation and Award Subcontract Management Construction Start-up Support</p> <p><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></p>
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Project Manager 	Control Account Manager 	Control Team Manager 
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**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE		2. DATE	
FEMP (DEFENSE)		12/01/2000	Page 2
3. WBS ELEMENT CODE	4. WBS ELEMENT TITLE/NAME		
1.1.H.B	SILOS 3		
5. PERFORMING DIV/DEPARTMENT CODE	6. ORIGINATOR NAME/PHONE	7. WBS ELEMENT MANAGER	
4304	R. FELLMAN	R. FELLMAN	
8. BUDGET AND REPORTING NUMBER	9. BUDGET TITLE		
EW05H3070	SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?		11. ESTIMATED START / COMPLETION DATE	
NEW PER CP# FY01-0115-0007-00		11/01 - 12-03	
12. TASK IDENTIFICATION (WORK PACKAGE)	13. TASK DESCRIPTION (ONE LINE)		
HS3AC	CONSTRUCTION MANAGEMENT		
14. ELEMENT TASK DESCRIPTION			
Construction Subcontracts			

**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE  FEMP (DEFENSE)		2. DATE  12/01/2000	Page 1
3. WBS ELEMENT CODE  1.1.1.H.B	4. WBS ELEMENT TITLE/NAME  SILOS 3		
5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  05/02 - 12/02	
12. TASK IDENTIFICATION (WORK PACKAGE)  HS3AD	13. TASK DESCRIPTION (ONE LINE)  SUBCONTRACTS		

<p>14. ELEMENT TASK DESCRIPTION</p> <p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Subcontractors</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>Activities conducted to construct the facilities required for Silo 3 remediation</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>Silo 3 construction will be performed by subcontractors using Greater Cincinnati Building and Construction Trades Council (GCBCTC) labor in accordance with the Project Labor Agreement (PLA). Subcontracts will be awarded for civil, mechanical and electrical work. Subcontractors will be required to perform the construction work in accordance with the established contracts. The following subtasks have been identified for the Subcontracts task:</p> <p>Civil Contractor Fieldwork Mechanical Contractor Fieldwork Electrical Contractor Fieldwork</p> <p><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></p> <p>Fluor Fernald Construction Management Long lead equipment procurement</p>
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Project Manager 	Control Account Manager 	Control Team Manager 
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## WORK SCOPE DEFINITION (Work Package)

1. PROJECT TITLE  FEMP (DEFENSE)		2. DATE  12/01/2000	Page 1
3. WBS ELEMENT CODE  1.1.H.B	4. WBS ELEMENT TITLE/NAME  SILOS 3		
5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  05/02 - 10/03	
12. TASK IDENTIFICATION (WORK PACKAGE)  HS3AE	13. TASK DESCRIPTION (ONE LINE)  STARTUP/STARTUP REVIEW		
<p>14. ELEMENT TASK DESCRIPTION</p> <p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Subcontractors ODCs Material</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>The Startup/Startup Review task consists of those activities necessary to demonstrate that the project has been properly constructed and ready for operations and that the workforce has been properly trained and is ready to safely operate the facility.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>The Startup/Startup Review task includes project preparation and evaluation of personnel and qualifications, facility and process hardware, engineering and administrative controls, procedures and training against documented safety and design bases. Start up management also includes procurement of supplies and materials necessary to start operations. Additionally the scope includes an evaluation of operational readiness by Fluor Fernald and a subsequent readiness evaluation by DOE-FEMP. The Startup/Startup Review task consists of the following subtasks:</p> <p>Startup Management Operating Procedures Final Hazard Analysis Report Maintenance Plan Develop Pre-operations Training</p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard Weeks</i>	

**WORK SCOPE DEFINITION**  
(Work Package)

1. PROJECT TITLE  FEMP (DEFENSE)		2. DATE  12/01/2000	Page 2
3. WBS ELEMENT CODE  1.1.H.B	4. WBS ELEMENT TITLE/NAME  SILOS 3		
5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  05/02 - 10/03	
12. TASK IDENTIFICATION (WORK PACKAGE)  HS3AE	13. TASK DESCRIPTION (ONE LINE)  STARTUP/STARTUP REVIEW		

14. ELEMENT TASK DESCRIPTION

Conduct Training  
Develop System Operability Testing Procedures  
Conduct System Operability Tests  
Operational Readiness Review

**d. WORK SPECIFICALLY EXCLUDED:**

None

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3. WBS ELEMENT CODE  1.1.H.B	4. WBS ELEMENT TITLE/NAME  SILOS 3		
5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  11/03 - 11/04	
12. TASK IDENTIFICATION (WORK PACKAGE)  HS3AF	13. TASK DESCRIPTION (ONE LINE)  REMEDIAL ACTION		
<div>14. ELEMENT TASK DESCRIPTION</div> <div><b><u>a. ELEMENTS OF COST:</u></b></div> <div>Labor Subcontractors ODCs Material</div> <div><b><u>b. TECHNICAL CONTENT:</u></b></div> <div>The Remedial Action task consists of those activities necessary to support the operation of the Silo 3 facility and process.</div> <div><b><u>c. SCOPE OF WORK:</u></b></div> <div>Remedial Action includes retrieval of Silo 3 material, treatment to meet the disposal facility WAC, and packaging and preparation for shipment. Facility ownership activities and utilities are also covered under this scope of work. Procurement of remaining operations materials and supplies is also included. All of these activities will be performed as part of the following subtask:</div> <div>Operations</div> <div><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></div> <div>Shipment of Silo 3 material</div>			
Project Manager <i>Robert Fellman</i>		Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Hugh Porter</i>





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3. WBS ELEMENT CODE  1.1.H.B	4. WBS ELEMENT TITLE/NAME  SILOS 3		
5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/03 - 11/04	
12. TASK IDENTIFICATION (WORK PACKAGE)  HS3AG	13. TASK DESCRIPTION (ONE LINE)  SHIPPING		
<div>14. ELEMENT TASK DESCRIPTION</div> <div><b><u>a. ELEMENTS OF COST:</u></b></div> <div>Labor Subcontractors ODCs Material</div> <div><b><u>b. TECHNICAL CONTENT:</u></b></div> <div>Activities included to ship the Silo 3 waste off-site to Envirocare</div> <div><b><u>c. SCOPE OF WORK:</u></b></div> <div>The scope of work for the Shipping task includes manifesting the waste, shipping the material to Envirocare, and disposal of treated Silo 3 material. The Shipping task also includes those activities necessary to support the proper management and disposal of secondary waste generated during the Remedial Action. The Shipping task consists of the following subtasks: Shipping Disposal</div> <div><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></div> <div>None</div>			
Project Manager <i>Robert Fellman</i>		Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Annika Weeks</i>



# **WORK SCOPE DEFINITION** (Work Package)

1. PROJECT TITLE <b>FEMP (DEFENSE)</b>		2. DATE <b>12/01/2000</b>	Page 1
3. WBS ELEMENT CODE <b>1.1.H.B</b>	4. WBS ELEMENT TITLE/NAME <b>SILOS 3</b>		
5. PERFORMING DIV/DEPARTMENT CODE <b>4304</b>	6. ORIGINATOR NAME/PHONE <b>R. FELLMAN</b>	7. WBS ELEMENT MANAGER <b>R. FELLMAN</b>	
8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>06/04 - 02/05</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HS3AH</b>	13. TASK DESCRIPTION (ONE LINE) <b>SHUTDOWN</b>		
14. ELEMENT TASK DESCRIPTION			
<p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Subcontractors ODCs Material</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>Fluor Fernald will perform shutdown activities to place the Silo 3 remediation and support facilities in a controlled state ready for dismantlement.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>The primary purpose of facility shutdown is to isolate all utilities to the facilities, remove gross quantities of hold-up from existing equipment, ductwork, pipes, and perform gross decontamination to prepare for dismantlement. Dismantlement of the Silo 3 facility, equipment and silo is excluded from this scope [Exclusion EX3]. Shutdown will be accomplished within the following subtasks: Safe Shutdown Documentation Safe Shutdown</p> <p><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></p> <p>D&amp;D of the Facilities</p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard Weeks</i>	



# **WORK SCOPE DEFINITION** (Work Package)

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3. WBS ELEMENT CODE <b>1.1.H.B</b>	4. WBS ELEMENT TITLE/NAME <b>SILOS 3</b>		
5. PERFORMING DIV/DEPARTMENT CODE <b>4304</b>	6. ORIGINATOR NAME/PHONE <b>R. FELLMAN</b>	7. WBS ELEMENT MANAGER <b>R. FELLMAN</b>	
8. BUDGET AND REPORTING NUMBER <b>EW05H3070</b>	9. BUDGET TITLE <b>SILOS</b>		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE? <b>NEW PER CP# FY01-0115-0007-00</b>		11. ESTIMATED START / COMPLETION DATE <b>06/04 - 02/05</b>	
12. TASK IDENTIFICATION (WORK PACKAGE) <b>HS3AH</b>	13. TASK DESCRIPTION (ONE LINE) <b>SHUTDOWN</b>		
14. ELEMENT TASK DESCRIPTION  <p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Subcontractors ODCs Material</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>Fluor Fernald will perform shutdown activities to place the Silo 3 remediation and support facilities in a controlled state ready for dismantlement.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>The primary purpose of facility shutdown is to isolate utilities to the facilities, remove gross quantities of hold-up from existing equipment, ductwork, pipes, and perform gross decontamination to prepare for dismantlement. Dismantlement of the Silo 3 facility, equipment and silo is excluded from this scope [Exclusion EX3]. Shutdown will be accomplished within the following subtasks: Safe Shutdown Documentation Safe Shutdown</p> <p><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></p> <p>D&amp;D of the Facilities</p>			
Project Manager <i>Robert Fellman</i>		Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>George J. Wells</i>



# WORK SCOPE DEFINITION

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3. WBS ELEMENT CODE  1.1.H.B	4. WBS ELEMENT TITLE/NAME  SILOS 3		
5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/00 - 03/05	
12. TASK IDENTIFICATION (WORK PACKAGE)  HS3AK	13. TASK DESCRIPTION (ONE LINE)  CONCEPTUAL DESIGN - FFI		
14. ELEMENT TASK DESCRIPTION  <div style="margin-top: 20px;"> <p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Subcontractors ODCs Material</p> </div> <div style="margin-top: 20px;"> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>The conceptual design activity contains the necessary Fluor Fernald resources to complete the conceptual design package for the Silo 3 remediation process.</p> </div> <div style="margin-top: 20px;"> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>Conceptual design will be initially developed by Fluor Fernald with the support of Jacobs Engineering. The conceptual design includes such activities as preparing the Design Basis and Requirements, conducting a structural evaluation, and preparing the necessary design drawings and documents to establish the technical baseline. The conceptual design activity for Fluor Fernald includes the following subtask.</p> <ul style="list-style-type: none"> <li>- Conceptual Design</li> </ul> </div> <div style="margin-top: 20px;"> <p><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></p> <p>Jacobs Engineering conceptual design costs</p> </div>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard Roberts</i>	





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5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/00 - 03/05	
12. TASK IDENTIFICATION (WORK PACKAGE)  HS3AL	13. TASK DESCRIPTION (ONE LINE)  CONCEPTUAL DESIGN - JACOBS		
<div>14. ELEMENT TASK DESCRIPTION</div> <div><b><u>a. ELEMENTS OF COST:</u></b></div> <div>Labor Subcontractors ODCs Material</div> <div><b><u>b. TECHNICAL CONTENT:</u></b></div> <div>The conceptual design activity contains the necessary Jacobs Engineering resources to complete the conceptual design package for the Silo 3 remediation process.</div> <div><b><u>c. SCOPE OF WORK:</u></b></div> <div>Conceptual design will be initially developed by Fluor Fernald with the support of Jacobs Engineering. The conceptual design includes such activities as preparing the Design Basis and Requirements, conducting a structural evaluation, and preparing the necessary design drawings and documents to establish the technical baseline. The conceptual design activity for Fluor Fernald includes the following subtask. - Conceptual Design</div> <div><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></div> <div>Fluor Fernald conceptual design costs</div>			
Project Manager <i>Robert Fellman</i>		Control Account Manager <i>Robert Fellman</i>	Control/Team Manager <i>Howard J. Smith</i>



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5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/00 - 03/05	
12. TASK IDENTIFICATION (WORK PACKAGE)  HS3AM	13. TASK DESCRIPTION (ONE LINE)  PRELIMINARY DESIGN - FFI		
<div>14. ELEMENT TASK DESCRIPTION</div> <div><b><u>a. ELEMENTS OF COST:</u></b></div> <div>Labor Subcontractors ODCs Material</div> <div><b><u>b. TECHNICAL CONTENT:</u></b></div> <div>The conceptual design activity contains the necessary Fluor Fernald resources to support and oversee completion of preliminary design activities for the Silo 3 remediation process design.</div> <div><b><u>c. SCOPE OF WORK:</u></b></div> <div>Jacobs Engineering, with the support of Fluor Fernald, will be responsible for completing preliminary design of Silo 3 facilities. Preliminary design consists of preparing long lead specifications and issuing these specifications for bid, preparing preliminary structural steel designs and drawings, and preliminary concrete design and drawings. The preliminary design activity for Fluor Fernald includes the following subtask. - Preliminary Design</div> <div><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></div> <div>Jacobs Engineering preliminary design costs</div>			
Project Manager <i>Robert Fellman</i>		Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard [Signature]</i>



**WORK SCOPE DEFINITION**  
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1. PROJECT TITLE  FEMP (DEFENSE)		2. DATE  12/01/2000	Page 1
3. WBS ELEMENT CODE  1.1.H.B	4. WBS ELEMENT TITLE/NAME  SILOS 3		
5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/00 - 03/05	
12. TASK IDENTIFICATION (WORK PACKAGE)  HS3AN	13. TASK DESCRIPTION (ONE LINE)  PRELIMINARY DESIGN - JACOBS		
<p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Subcontractors ODCs Material</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>The conceptual design activity contains the necessary Jacobs Engineering resources to conduct preliminary design activities for the Silo 3 remediation process design.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>Jacobs Engineering, with the support of Fluor Fernald, will be responsible for completing preliminary design of Silo 3 facilities. Preliminary design consists of preparing long lead specifications and issuing these specifications for bid, preparing preliminary structural steel designs and drawings, and preliminary concrete design and drawings. The preliminary design activity for Jacobs includes the following subtask. - Preliminary Design</p> <p><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></p> <p>Fluor Fernald preliminary design costs</p>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard P. Weiss</i>	



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3. WBS ELEMENT CODE  1.1.H.B	4. WBS ELEMENT TITLE/NAME  SILOS 3		
5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/00 - 03/05	
12. TASK IDENTIFICATION (WORK PACKAGE)  HS3AP	13. TASK DESCRIPTION (ONE LINE)  FINAL DESIGN - FFI		
<div>14. ELEMENT TASK DESCRIPTION</div> <div><p><b><u>a. ELEMENTS OF COST:</u></b></p><p>Labor Subcontractors ODCs Material</p><p><b><u>b. TECHNICAL CONTENT:</u></b></p><p>The final design activity contains the necessary Fluor Fernald resources to support and oversee completion of the Final Design packages for construction of the Silo 3 remediation facility.</p><p><b><u>c. SCOPE OF WORK:</u></b></p><p>Final design commences upon award of procurement contracts for long lead equipment to vendors during preliminary design. Jacobs Engineering, with the support of Fluor Fernald, will be responsible for preparing the final design package, which will contain the detailed drawings and specifications necessary to construct the silo 3 remediation processes. The final design activity for Fluor Fernald includes the following subtask.</p><p>- Final Design</p><p><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></p><p>Jacobs Engineering final design costs</p></div>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>George D. White</i>	





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5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/00 - 03/05	
12. TASK IDENTIFICATION (WORK PACKAGE)  HS3AR	13. TASK DESCRIPTION (ONE LINE)  FINAL DESIGN - JACOBS		
<div>14. ELEMENT TASK DESCRIPTION</div> <div style="margin-top: 20px;"><b><u>a. ELEMENTS OF COST:</u></b></div> <div style="margin-top: 10px;">Labor Subcontractors ODCs Material</div> <div style="margin-top: 20px;"><b><u>b. TECHNICAL CONTENT:</u></b></div> <div style="margin-top: 10px;">The final design activity contains the necessary Jacobs Engineering resources to complete the Final Design packages for construction of the Silo 3 remediation facility.</div> <div style="margin-top: 20px;"><b><u>c. SCOPE OF WORK:</u></b></div> <div style="margin-top: 10px;">Final design commences upon award of procurement contracts for long lead equipment to vendors during preliminary design. Jacobs Engineering, with the support of Fluor Fernald, will be responsible for preparing the final design package, which will contain the detailed drawings and specifications necessary to construct the silo 3 remediation processes. The final design activity for Jacobs includes the following subtask. - Final Design</div> <div style="margin-top: 20px;"><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></div> <div style="margin-top: 10px;">Fluor Fernald final design costs</div>			
Project Manager <i>Robert Fellman</i>		Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard West</i>



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5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/00 - 03/05	
12. TASK IDENTIFICATION (WORK PACKAGE)  HS3AS	13. TASK DESCRIPTION (ONE LINE)  TITLE III SUPPORT - FFI		
<p>14. ELEMENT TASK DESCRIPTION</p> <p><b><u>a. ELEMENTS OF COST:</u></b></p> <p>Labor Subcontractors ODCs Material</p> <p><b><u>b. TECHNICAL CONTENT:</u></b></p> <p>The Title III support activity contains the necessary Fluor Fernald engineering resources to support construction of the Silo 3 remediation process.</p> <p><b><u>c. SCOPE OF WORK:</u></b></p> <p>Title III support for Fluor Fernald includes Fluor Fernald support of activities as approving vendor submittals, participating in equipment inspections and tests during fabrication, participating in equipment receipt inspections and field inspections, process requests for clarification and design change notices, and prepare record drawings from construction redline drawings. The conceptual design activity for Fluor Fernald includes the following subtask. - Title III Engineering Support</p> <p><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></p> <p>Jacobs Engineering Title III costs</p>			
Project Manager <i>Robert Fellman</i>		Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Barry White</i>



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5. PERFORMING DIV/DEPARTMENT CODE  4304	6. ORIGINATOR NAME/PHONE  R. FELLMAN	7. WBS ELEMENT MANAGER  R. FELLMAN	
8. BUDGET AND REPORTING NUMBER  EW05H3070	9. BUDGET TITLE  SILOS		
10. ORIGINAL SCOPE? / CHANGE TO WORK SCOPE? / NEW SCOPE?  NEW PER CP# FY01-0115-0007-00		11. ESTIMATED START / COMPLETION DATE  12/00 - 03/05	
12. TASK IDENTIFICATION (WORK PACKAGE)  HS3AT	13. TASK DESCRIPTION (ONE LINE)  TITLE III SUPPORT - JACOBS		
<div>14. ELEMENT TASK DESCRIPTION</div> <div style="margin-top: 20px;"><b><u>a. ELEMENTS OF COST:</u></b></div> <div style="margin-top: 20px;">Labor Subcontractors ODCs Material</div> <div style="margin-top: 20px;"><b><u>b. TECHNICAL CONTENT:</u></b></div> <div style="margin-top: 20px;">The Title III support activity contains the necessary Jacobs engineering resources to support construction of the Silo 3 remediation process.</div> <div style="margin-top: 20px;"><b><u>c. SCOPE OF WORK:</u></b></div> <div style="margin-top: 20px;">Title III support includes Jacobs activities and engineer or record, including activities such as approving vendor submittals, participating in equipment inspections and tests during fabrication, participating in equipment receipt inspections and field inspections, process requests for clarification and design change notices, and prepare record drawings from construction redline drawings. The conceptual design activity for Jacobs includes the following subtask. - Title III Engineering Support</div> <div style="margin-top: 20px;"><b><u>d. WORK SPECIFICALLY EXCLUDED:</u></b></div> <div style="margin-top: 20px;">Fluor Fernald Engineering Title III costs</div>			
Project Manager <i>Robert Fellman</i>	Control Account Manager <i>Robert Fellman</i>	Control Team Manager <i>Howard P. [Signature]</i>	



## **SECTION 2**

### **1.0 NARRATIVE**





1. PROJECT TITLE: SILOS PROJECT	2. DATE: 09/10/01	3. PBS#: 07
4. WBS ELEMENT CODE: 1.1.H.B.	5. WBS ELEMENT TITLE: SILO 3	
6. CAM NAME/ PHONE: ROBERT FELLMAN/DENNIS NIXON	7. CAM SIGNATURE:	
8. ORIGINAL/ CHANGE SCOPE/ PER CP#:	9. CONTROL ACCOUNT: HS3A	

## SECTION 2: HS3A – SILO 3

### 1.0 NARRATIVE

#### 1.1 OVERVIEW

This Closure Plan defines the scope of work to be performed on the Operable Unit 4 (OU4) Silo 3 Project at the U.S. Department of Energy (DOE) Fernald Environmental Management Project (FEMP). The overall objective for this project is the safe removal, stabilization, transportation and disposal of Silo 3 material to meet the waste acceptance criteria (WAC) of an off-site disposal facility, in a safe, timely, efficient, and cost-effective manner. The final remedial action will be executed in accordance with the OU4 Record of Decision (ROD) and the Silo 3 Explanation of Significant Differences (ESD). ~~In addition, prior to remediation of Silo 3 material, the Silo 3 treatment process will be used to blend fissile compounds from the Nuclear Materials Disposition (NMD) Project with soil to meet U.S. Department of Transportation (DOT) shipping requirements and the WAC for Envirocare of Utah.~~ In order to accomplish these objectives, the Silo 3 Project has been divided into the tasks (charge numbers) described below:

R1-  
F07-  
028

R1-  
F07-  
025

- Project Management (Charge Number HS3AA)
- ~~Remedial~~ Design Documentation – Fluor Fernald (Charge Number HS3AB)
- Conceptual Design – Fluor Fernald (Charge Number HS3AK)
- Conceptual Design – Jacobs (Charge Number HS3AL)
- Preliminary Design – Fluor Fernald (Charge Number HS3AM)
- Preliminary Design – Jacobs (Charge Number HS3AN)
- Final Design – Fluor Fernald (Charge Number HS3AP)
- Final Design – Jacobs (Charge Number HS3AR)
- Title III Support – Fluor Fernald (Charge Number HS3AS)
- Title III Support – Jacobs (Charge Number HS3AT)
- Construction Management (Charge Number HS3AC)
- Subcontracts (Charge Number HS3AD)
- Startup/Startup Review (Charge Number HS3AE)
- Remedial Action (Charge Number HS3AF)
- Shipping (Charge Number HS3AG)
- Shutdown (Charge Number HS3AH)

## 1.2 ASSUMPTIONS/EXCLUSIONS

### 1.2.1 Assumptions

R1-  
F07-  
028

The information provided throughout this Closure Plan is based on a pre-conceptual design for remediation of Silo 3 ~~and the processing of fissile compounds~~. This Closure Plan is based on the key assumptions identified below.

**TABLE 1-2.1  
SUMMARY OF ASSUMPTIONS**

ITEM NO.	DESCRIPTION
<b>ADMINISTRATIVE</b>	
A1	<u>Project Execution Plan (PEP)</u> – A PEP will be required. The PEP will be developed at a division level to cover all three Silos subprojects. This scope is not included in the Silo 3 baseline. The scope for this activity will be included in the Silos Division Project Management account (HPM1A). <del>The PEP will be reviewed annually and revised as needed.</del>
A2	<u>Engineering/Construction Document Control (ECDC)</u> – ECDC will provide document control for the project.
A3	<u>Critical Analysis Team (CAT)</u> – The Department of Energy (DOE)-FEMP will continue to employ the use of the CAT to serve as an independent technical resource to review and comment on the Silo 3 documentation.
A4	<u>Project Assessments</u> – One management assessment and one project self-assessment are assumed each year.
A5	<u>Quality Assurance (QA) Assessments</u> – No more than one internal assessment by Fluor Fernald QA or other organizations will be conducted per year.
A6	<u>Assessments by External Organizations</u> – No more than two assessments per year by external organizations are planned. External organizations include Defense Nuclear Facility Safety Board (DNFSB), ICE Team, DOE Headquarters (HQ), National Academy of Sciences, Inspector General (IG), Association of Toxic Substance and Disease Registry (ATSDR), Stakeholder Committees, Army Corp of Engineers (ACE) and General Accounting Office (GAO).
A7	<u>Quality Assurance Job-Specific Plan</u> – It is assumed that a Quality Assurance Job-Specific Plan (QAJSP) will not be required. The program that Quality Control (QC) will abide by when conducting work on the Silo 3 Project will be RM-0012, "Quality Assurance Program" (Rev. 5). This program will be applied to each system, structure and component (SSC) using a graded approach. The QC requirements will be based on the performance grading assigned to each SSC. These requirements will be incorporated into each applicable section of the construction contracts (i.e., specifications, Part 9). By applying RM-0012 to the project and incorporating QC into the construction contracts, a QAJSP would not be necessary. If a QAJSP were required, the scope for developing this document would be included in the Silos Division Project Management account (HPM1A).

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ITEM NO.	DESCRIPTION
ADMINISTRATIVE (Cont.)	
R1-D-061	A8 <u>DOE Order 413.3</u> - DOE Order 413.3, Paragraph 8.d, is applicable to capital assets, such as land, structure, equipment and information technology (e.g., hardware, software, and applications) used by the Federal Government that are estimated to have a useful life of two years or more. DOE Order 413.3 requirements will be applied to the Silo 3 Project; however, the existing project controls system will provide all required reporting.
R1-D-212	
REGULATORY	
R1	<u>ROD</u> – The treatment of Silo 3 material will be conducted in accordance with the clean-up objectives and requirements, identified in the Record of Decision for Remedial Actions at Operable Unit 4", December 1994. No change required to the OU4 ROD.
R2	<u>ESD</u> – Silo 3 material will be stabilized in accordance with the Silo 3 ESD, approved by the United States Environmental Protection Agency (USEPA) on March 27, 1998, including the specified Applicable, Relevant and Appropriate Requirements (ARARs) contained in the ESD.
R3	<u>11(e)(2)</u> – Silo 3 material is classified as "by-product material," as defined under Section 11(e)(2) of the Atomic Energy Act (AEA) of 1954. Silo 3 material is specifically exempt, as defined, from regulation as solid waste under Resource Conservation and Recovery Act (RCRA) 40 CFR Part 261.4(a)(4).
R1-F07-024	R4 <u>Remedial Action Work Plan (RAWP)</u> – EPA <del>will renegotiated</del> the RAWP milestone for the Silo 3 Project. The milestone for submittal of the draft RAWP to EPA for review is October 6, 2003. <del>Currently, the RAWP must be submitted to EPA on or before May 1, 2001. It is assumed that the EPA will not impose a penalty for this renegotiation.</del> Per the Remedial Design Deliverables Schedule, the RAWP will provide USEPA and Ohio EPA (OEPA) with milestones for implementation of the Silo 3 remedial action and contain a brief overview description of operations. Specific operations information (e.g., environmental controls) will be provided in the Remedial Design (RD) Package.
R1-D-197	

ITEM NO.	DESCRIPTION
REGULATORY (Cont.)	
R5	<p><u>RD Package</u> - A Remedial Design Package must be resubmitted to USEPA and OEPA. <u>The milestone for submittal of the draft revised RD Package to EPA for review is August 22, 2002. The level of documentation required will not be greater than the documentation contained in the RD Package for Silo 3 that was prepared by Rocky Mountain Remediation Services (RMRS) and approved by USEPA on September 27, 2000. The following principal elements will be included in the revised RD Package:</u></p> <ul style="list-style-type: none"> <li>- <u>Process Description</u></li> <li>- <u>Retrieval Description</u></li> <li>- <u>Process Flow Diagrams (PFDs)</u></li> <li>- <u>General Arrangement (GA) Drawings</u></li> <li>- <u>Heat and Material Balance</u></li> <li>- <u>Process Control Plan</u></li> <li>- <u>Sampling and Analysis Plan</u></li> <li>- <u>Environmental Control Plan</u></li> <li>- <u>Transportation and Disposal Plan</u></li> <li>- <u>Silo 3 Gross Decontamination Plan</u></li> <li>- <u>Applicable, Relevant and Appropriate (ARARs) Compliance Strategy</u></li> <li>- <u>Contingency Plan</u></li> <li>- <u>Health and Safety Controls</u></li> <li>- <u>Environmental Monitoring</u></li> </ul> <p><u>The existing Process Description, Retrieval Technology Description, PFDs, GAs and Heat and Material Balance documents prepared by RMRS will be completely replaced with new documents. The existing versions of the remaining elements identified above will be updated as necessary to reflect the new design.</u></p> <p><del>Changes to the RD Package will only be required as follows:</del></p> <ul style="list-style-type: none"> <li><del>- Minimal changes to air emissions control plan, fugitive dust control, wastewater control, erosion and stormwater control</del></li> <li><del>- Revision to waste management requirement</del></li> <li><del>- Revision to Transportation and Disposal Plan to reflect current strategy</del></li> <li><del>- Revision to Sampling and Analysis Plan to reduce sample requirements and only meet Envirocare waste acceptance criteria requirements</del></li> <li><del>- Minor revision to Silo Gross Decontamination Plan and Silos Environmental Monitoring Plan.</del></li> <li><del>- Revision to hazard analysis for Contingency Plan</del></li> <li>- <u>Revision to references for Health and Safety Controls</u></li> </ul>

R1-D-198

R1-F07-024

ITEM NO.	DESCRIPTION
REGULATORY (Cont.)	
R6	<u>Stakeholders</u> – Stakeholder acceptance of the new approach for Silo 3 remediation is assumed.
R7	<u>EPA Interface</u> – Review cycles of RD Package and RAWP will be consistent with the primary document review cycles specified in the Amended Consent Agreement. The USEPA and OEPA will require approval of design change notices (DCNs) that change items contained in the approved RD Package. DCNs will be reviewed within one working day. Design changes that do not affect the RD Package documents will not require EPA approval.
R8	<u>Regulatory Requirements</u> – Activities described in this Closure Plan shall be performed in accordance with all applicable regulatory requirements and consistent with any agreements, Orders, permits, or similar documents identified in this Closure Plan. These include, but are not limited to, the ARARs and “to be considered” (TBC) criteria identified in the OU4 Record of Decision (ROD) and the Amended Consent Agreement.
R9	<u>DOT Requirements</u> – For purposes of proper packaging and transportation of the Silo 3 material, the material is governed by DOT regulations under 49 CFR Subtitle B, Chapter I, Subchapter C, “Hazardous Materials Regulations.”
R10	<u>DOT Classification</u> – Silo 3 is currently classified as low specific activity-type II (LSA-II) material for shipment. An exemption will be granted by DOT allowing Silo 3 material to be shipped in strong tight containers. This exemption only applies to the DOE rail cars on the unit train traveling to Envirocare. The exempted rail car will be considered the DOT package for Silo 3 material. The DOT exemption that covers Silo 3 material will be obtained utilizing WPRAP program support labor. No labor for this effort is budgeted for the Silo 3 Project.
SAFETY & HEALTH	
SA1	<u>Radiological Protection</u> – For purposes of 10 CFR 835, retrieval operations will be considered a safe shutdown-type activity, not a new facility activity. Containment or wetting methods will be required to control radiological airborne activity.
SA2	<u>Fire Protection</u> – Due to the temporary nature of any containments constructed to support this project, no fire sprinkling will be required. The existing exemption based on maximum permissible fire loss remains in effect.

ITEM NO.	DESCRIPTION
SAFETY & HEALTH (Cont.)	
R1-D-199	SA3 <u>Occupational Safety and Health</u> – Thorium-230 (Th-230) is the contaminant of concern for purposes of worker protection. No heavy metals contained in Silo 3 material will drive more stringent worker protection requirements. <u>Based on the RI/FS data, Bberyllium monitoring is not necessary for workers on Silo 3. Unless beryllium concentrations in current samples exceed the trigger level for the beryllium regulation, beryllium monitoring will not be implemented.</u> Heat and cold stress controls will be required. Physiological monitoring may be used to calculate stay times.
	SA4 <u>Hazard Categorization</u> – Based on the available inventory of radioactive material, Silo 3 is a hazard category 3 (HC3) non-reactor nuclear facility.
R1-D-226	SA5 <u>Nuclear System Safety</u> – It is assumed that a Preliminary Hazard Analysis Report (PHAR) and Final Hazard Analysis Report (FHAR) will be required for the remedial action activities (i.e., retrieval, treatment, material movement, etc.). A HAR is defined in Fluor Fernald Nuclear and Systems Safety procedures as a graded SAR. The existing PHAR covers the first five chapters of a standard SAR and addresses the remaining chapters by reference to existing site programs. The existing PHAR will cover a large portion of the activities, but will require some modification. Waiver of the PHAR will be pursued based on limited retrieval equipment, however, the acceptance of a waiver is not assumed for purposes of this baseline. The PHAR and FHAR will require approval by the DOE-Ohio Field Office (OFO). A 30-day DOE review of the draft document will be necessary.
R1-D-228	
	SA6 <u>Waste Pits Remediation Action Project (WPRAP) Safety Basis</u> - Based on the HC3 inventory threshold values identified in DOE-STD-1027-92 Chg 1, approximately 7.6 tons of untreated Silo 3 material would result in classification of a facility as HC3. WPRAP currently operates below this threshold, as a radiological facility. The dose conversion factor (DCF) for Silo 3 material is calculated to be 2.9E+04 millirem (CEDE) per gram inhaled. The bounding analysis for WPRAP assumed black oxide (U <sub>3</sub> O <sub>8</sub> ) as the source term, which has a DCF of 3.1E+04 mrem/gram.  Based on the inventory threshold values and DCF, it can be shown that the material characteristics of the stabilized (wetted, soil-like) Silo 3 material are similar to the waste pit material and are represented by the characteristics described by the WPRAP hazard category calculations (HCCs). Thus, it is assumed that Silo 3 material could be shipped and handled under the existing WPRAP Auditable Safety Report (ASR), and that WPRAP would remain a radiological facility.
R1-D-200	SA7 <u>Emergency Preparedness</u> – Emergency preparedness will be supplied by FEMP services in the event of an emergency. No disaster drills are planned for this project, however, for purposes of startup, project-specific emergency response training will be conducted. <del>an emergency operations drill may be conducted at the project.</del>

ITEM NO.	DESCRIPTION
<b>SAFETY &amp; HEALTH (Cont.)</b>	
SA8	<u>Dome Loading Limits</u> – Placement of loads on the dome must be restricted so that no live load greater than 700 lbs (including up to 3 persons), other than snow, is applied to the dome. Equipment live loads must be distributed over the largest area practical. In no case shall equipment live loads be distributed over an area smaller than 3-feet in diameter. Loads must be measured or estimated by calculation prior to placement of the load on the dome. Changes in dead load to the silo must be evaluated. Workers must have fall protection when working on the dome.
SA9	<u>Normally Occupied Area</u> - The maximum allowable average airborne radon concentration in a normally occupied work area is 4 pCi/L with a maximum of 30 pCi/L instantaneous radon concentration.
<b>GENERAL</b>	
G1	<u>Quantity</u> – There is approximately 5,088 yd <sup>3</sup> of material in Silo 3. The maximum density of material is 58 lb/ft <sup>3</sup> , which equates to 3,925 tons of material.
G2	<u>Density</u> – The density of Silo 3 material ranges from 29 lb/ft <sup>3</sup> to 58 lb/ft <sup>3</sup> . Silo 3 material is non-plastic.
G3	<u>Particle Size</u> – Silo 3 material is powder-like. Approximately 90% passes through a 200-mesh sieve (0.074mm) as determined in the OU4 Remedial Investigation (RI). Based on Argonne Laboratory Laser Light Scattering test data, the average particle size in the 0.001 to 1 $\mu$ m range is 0.2 $\mu$ m, with a peak range of 0.05 to 0.35 $\mu$ m. Argonne also determined, using Scanning Electron Microscope, that 90 percent of the particulates counted ranged between 0.05 and 5 $\mu$ m.
G4	<u>Chemical Constituents</u> - The chemical make up of Silo 3 material is consistent with the data presented in the Remedial Investigation/Feasibility Study (RI/FS). Silo 3 material also contains high sulfates, 15 weight percent by dry weight, as determined during FS studies conducted by Battelle National Laboratories. Table A-1 (Appendix A) presents the chemical concentrations.
G5	<u>Toxicity Characteristic Leachate Procedure (TCLP) Concentrations</u> – Existing TCLP data for Silo 3 is presented in Table A-2 of Appendix A. With the exception of the 1989 RI/FS EP Toxicity analysis, no samples have ever failed TCLP for cadmium and arsenic. Chromium and selenium do not greatly exceed regulatory limits. Concentrations in the silo are consistent with the data presented in Table A-2 (Appendix A).
G6	<u>Organic Constituents</u> – No volatile organic or semi-volatile organic compounds are present in Silo 3 material.
G7	<u>Radiological Constituents</u> – The radiological make up of Silo 3 material is consistent with the data presented in the RI/FS. Table A-3 and A-4 (Appendix A) present the radiological concentrations.
G8	<u>Solubility</u> – Silo 3 material is 30-50% soluble in water by weight. The material exhibits some heat of hydration upon reaction with water. Whether the material will expand when reacted with water is uncertain.

ITEM NO.	DESCRIPTION
<b>GENERAL (Cont.)</b>	
G9	<u>Moisture Content</u> – Silo 3 material ranges from 3.7 to 10.2 percent moisture.
G10	<u>Radon Headspace Concentration</u> – The headspace of Silo 3 contains approximately 300,000 pCi/L of Radium-226 (Ra-226). Volume of the Silo 3 headspace is approximately 5,600 ft <sup>3</sup> .
G11	<u>Compaction</u> – Based on data obtained during Silo 3 Small Scale Waste Retrieval, Silo 3 material is compacted at the perimeter and does not flow freely up to 11 feet above the bottom of the silo. This condition likely occurs throughout the bottom of the silo. For purposes of the baseline, it is assumed that two-thirds of the material contained in Silo 3 requires mechanical agitation to facilitate removal. The top third of the silo is assumed to be powdery and flowable, exhibiting a 30-degree angle of repose.
G12	<u>Material Distribution in Silo</u> – Based on visual observation during 1989 sampling, Silo 3 material is relatively evenly distributed within the silo with only minor peaks beneath the inlet ports.
G13	<u>Silo 3 Structure</u> – Silo 3 is a freestanding, pre-stressed concrete, domed silo measuring 80 feet in diameter and approximately 25 feet above ground level. The floor system is constructed of 17 inches of compacted clay, a 2-inch thick layer of asphaltic concrete, and an 8-inch layer of gravel topped by 4 inches of concrete. Silo 3 has no underdrain system. The domed roof tapers from 8 inches thick at the silo walls to 4 inches thick at the apex. The apex is 36 feet high. The walls are 27 feet high from the top of the foundation. Unlike Silos 1 and 2, Silo 3 contains increased reinforcing around the dome periphery (ring beam). This reinforcing was necessary to support the additional loading from the dust collector that has since been removed.
G14	<u>Manways</u> – The Silo 3 dome contains 7 manways. These manways have a 20-inch internal diameter.
G15	<u>Decant Ports</u> – Decant ports are present up the east and west sides of Silo 3. These decant ports contain an inner weir and baffle. Due to the compacted material present in Silo 3, the bottom seven decant ports can be opened (i.e., blind flange removed) using radiological controls only.
G16	<u>Debris</u> – Silo 3 is expected to contain minimal debris. Any debris contained in Silo 3 will be less than 2 feet in length in any given direction and less than 20 lbs in weight. It is anticipated that debris will be in the form of miscellaneous, simple hand tools.
<b>REMEDIAL DESIGN</b>	
RD1	<u>Design Organization</u> – Design activities will be completed by a Fluor Fernald, Inc. (Fluor Fernald) team, which includes Fluor Fernald, Duratek Federal Services (DFS) and Jacobs Engineering Group Inc. (Jacobs) personnel. <del>It is acceptable to prepare functional requirements for equipment and proceed straight to procurement, eliminating detailed design when feasible.</del>

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R1-F07-024



ITEM NO.	DESCRIPTION
<b>REMEDIAL DESIGN (Cont.)</b>	
RD2	<u>Structural</u> – The silo will require reinforcing prior to cutting. Specific reinforcing is described in the technical scope.
R1-F07-025	RD3 <del>Design Data Development</del> <u>Bench Scale Tests</u> –Design data development <del>Bench scale tests</del> will be conducted by Fluor Fernald in the FEMP laboratory to verify recipe formulation for Silo 3. These lab tests will also assess optimal moisture for Silo 3 material for evaluating disposal facility WAC. A test plan and radiological work permits will be required for conducting this work.
	RD4 <u>Sampling</u> – No additional material will be retrieved from Silo 3 for laboratory testing.
R1-F07-025	RD5 <del>Documentation</del> –Based on the simplicity of the approach, a Failure Modes and Effects Analysis (FMEA) will not be required. Equipment can be specified using appropriately modified RMRS specifications, and engineering design work can be limited to specific components that require design.
	RD6 <u>Extraction</u> – Portable vacuums and heavy equipment can be used.
	RD7 <u>Conveyance</u> – The project will use standard commercial equipment and will not ventilate the equipment.
	RD8 <u>Stabilization Equipment</u> - Mixing will be operated on a batch basis. Batch size will be equivalent to the size of a Lift Liner™ container.
	RD9 <u>Envirobond™</u> – Per the settlement agreement with RMRS, Envirobond™ will be provided by RMRS, at no cost to Fluor Fernald, in a quantity sufficient to treat 3,950 tons of Silo 3 material. No license fees or material costs will be incurred. A license agreement will be executed for this work.
	RD10 <u>Other Chemical Additives</u> – Ferrous sulfate will be added to Envirobond™ for stabilization of Silo 3 material.
	RD11 <u>Binding Agent</u> – A binding agent to cause agglomeration of Silo 3 material, reduce dusting, and prevent release of free liquids during transport may be utilized.
	RD12 <u>Recipe Formulation</u> – Per the settlement agreement, RMRS will provide up to 160 hours to confirm the necessary treatment formulation for Silo 3 material using Envirobond™.
	RD13 <u>Minimally Acceptable Formulation</u> – At a minimum, the formulation developed by RMRS for processing Silo 3 material would successfully treat Silo 3 material. This formulation required 17% moisture, 3% Envirobond™, and 2% ferrous sulfate, on dry waste basis.
R1-D-060	RD14 <u>Ventilation</u> - The ventilation of the facility will be designed around twelve air exchanges within a zone per hour. Air will be filtered through high-efficiency particulate air (HEPA) filters and ultra low penetration air (ULPA) filters (if required) and discharged through a stack with iso-kinetic and radon monitoring.
R1-D-841	RD15 <u>Facility Design</u> – It is assumed that the treatment facility will be designed and sized to process the material with <u>50%100%</u> plant availability (i.e., 200% equipment capacity).
R1-F07-024	

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<u>ITEM NO.</u>	<u>DESCRIPTION</u>
<b>REMEDIAL DESIGN (Cont.)</b>	
RD16	<del><u>Equipment Control</u></del> – The pneumatic equipment control panel will be provided by the manufacturer. The mixer, conveyors and additives feed systems will have control panels requiring manual start stop by the operator.
RD17	<u>Equipment Wash-Down</u> – Equipment will be provided with wash-down systems (ports and drains) for cleaning equipment.
<b>PROCUREMENT</b>	
PR1	<u>HEPA Units</u> – The site specification for portable HEPA units will be used to procure portable HEPA units.
PR2	<u>Government Services Administration (GSA)</u> – Materials and equipment can be purchased through GSA without requiring a sole source justification.
PR3	<u>Sole Source or Single Source Justifications</u> – Do not required DOE approval for purchases or contracts under \$25,000.
<b>CONSTRUCTION</b>	
CT1	<u>Construction Management Approach</u> – Fluor Fernald will self-perform as the general contractor and develop Invitations for Bid (IFBs) for civil, mechanical/piping, and electrical/instrumentation work. Survey work for redlines will be Fluor Fernald scope. No change to permitting requirements is assumed. Lock and tag procedures will be implemented, with current exemptions provided to construction equipment.
CT2	<u>Safe Work Plans (SWPs)</u> –SWPs and Health and Safety (H&S) matrix will be drafted by Fluor Fernald and provided in the IFBs. Subcontractors will be required to finalize the SWPs after contract award. Approval of the SWPs will require craft input.
CT3	<u>Construction Acceptance Testing (CAT)</u> – Fluor Fernald will perform field quality control (QC) and develop a CAT Plan. CAT testing will be performed by a geotechnical subcontractor.
CT4	<u>Soil Contamination</u> – Soil contamination exists around the silo, between the interim storage area (ISA) pad and Second Street, near the silo. This is the only area of known soil contamination. Since the ISA pad is constructed, contact with contaminated soil below the pad is not expected.
CT5	<u>Boundary Fencing</u> - Orange snow fencing, made of high-density polyethylene, will be adequate for boundary controls.
CT6	<u>Cutting Silo</u> – A water laser will be used to cut an opening in silo. An excavator to be used for material retrieval, will be used as rigging equipment to remove concrete sections of silo. It is assumed that a 15' h x 15' w opening can be cut with reinforcing.

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ITEM NO.	DESCRIPTION
<b>CONSTRUCTION (Cont.)</b>	
CT7	<u>Energy Isolation Program</u> - It is assumed the current Energy Isolation Program will not significantly change, and Energy Isolation Plans (EIPs) will be required for any utility tie-ins. Support will be required by the appropriate facility owners and/or utility engineer [Assistant Emergency Duty Officer (AEDO)]. The AEDO will continue to be approver for penetration permits as well.
CT8	<u>Mock-up of Silo Cutting</u> - Prior to cutting of Silo 3 for material retrieval, a mock-up of the Silo 3 cutting design will be performed on Silo 4 by a specialty subcontractor hired to cut Silo 3.
<b>UTILITIES</b>	
U1	<u>Site Drawings</u> - The Silo 3 utilities are found on Grid 31A and 31B, Underground Utility Detail Drawing 22A-5500-P-00961.
U2	<u>Electrical Service</u> - Electrical service will originate at the existing 34.5 KVA transformer and existing 1200A, 480V, 3 $\phi$ distribution switchgear (ref. 94X-5100-E-02238) located northwest of the silos. Electrical 480 V service to the new treatment facility should be run underground continuing from this duct bank.
U3	<u>Area Lighting</u> - Area lighting for the ISA pad originates from the electrical panel at WP70. Additional work is required to install lights on the west side of the pad and power the lights on the east side of the pad WP 155, WP 156, WP 157 (Ref. RMRS Dwg., 54-3060).
U4	<u>Lighting</u> - Building lighting will require installation of a lighting panel. Equipment will require installation of a step-down transformer and lighting panel.
U5	<u>Process Water</u> - Process water will be continued for the DW-4" high density polyethylene (HDPE) tie-in point located northeast of the silo (E 20 + 10.9 and S 19 + 40.6, Elev. 573.37). Process water will be run underground to the treatment facility and then overhead as service piping within the facility. Heat-tracing will be required for freeze protection.
U6	<u>Fire Water</u> - Fire Protection service will be from the existing fire hydrant (HFH 165). This hydrant provides a reliable water supply of adequate capacity for fire suppression. The fire water branch line (FQI-8" HDPE) installed by RMRS starting at PIV 221 and ending at PIV 236 will not be continued or put in service.
U7	<u>Emergency Evacuation</u> - An emergency evacuation system including fire detection and notification systems will be supplied from the panel in the Vitrification Pilot Plant or panel located in trailer T-414.
U8	<u>Breathing Air</u> - A breathing air system must be provided by the project. A portable 68 scfm breathing air trailer will be used. These are available on-site, but due to the dedicated use for the facility, one will be purchased.
U9	<u>Storm Sewer</u> - A storm sewer system has been installed for the Silo 3 sub-basin drainage area. No changes are expected to this system. (Ref. RMRS Dwg. 52-3016).
U10	<u>Heating</u> - Localized radiant heaters will be provided to allow work through the winter.

ITEM NO.	DESCRIPTION
<b>SUBCONTRACTS</b>	
SC1	<u>Number of Subcontracts</u> - Three major subcontracts will be issued during Construction, although additional subcontracts may be put in place to support these contracts.
SC2	<u>Electrical Supply</u> - The electrical power supply for subcontractors will be from the switchgear.
SC3	<u>Access Training</u> - Subcontractor personnel will require access training.
SC4	<u>Change and Restroom Facilities</u> - T-92 change and restroom facilities will be made available to the subcontractor. However, the subcontractors will be responsible for their own portable or temporary facilities (i.e. trailers, etc.). If for any reason the T-92 change and restroom facilities are not available, the subcontractor must furnish his own facilities.
<b>STARTUP</b>	
S1	<u>RMRS</u> - Per the settlement agreement, RMRS will supply 240 hours for development of operating procedures.
S2	<u>Basic Qualification</u> - Sufficient quantities of the worker classifications exist onsite. No additional fundamental training (such as chemical operator training) will be required by the Silo 3 Project to create the necessary pool of qualified workers to bid this job.
<b>STARTUP REVIEWS</b>	
SR1	<u>Operational Readiness Review (ORR)</u> - Two ORRs will be performed prior to the start of remedial action activities. A DOE ORR will commence immediately upon completion of the FEMP ORR. The entire ORR process will take 2 months or less.
SR2	<u>Standard Startup Review (SSR)</u> - There will be no separate SSR for rail operations since shipping will be performed under the existing WPRAP operations program.
<b>SILO 3 OPERATIONS</b>	
OP1	<u>Operations Organization</u> - Operators will not be available from the Advanced Waste Retrieval (AWR) operations to roll-over to Silo 3 operations. A new crew of operators will be required. However, maintenance can be shared with the AWR Project.
OP2	<u>Shifts</u> - The operating schedule for Silo 3 treatment is based on 10 hours/day, 4 days/week, for 215 <del>214</del> days at 70% availability. No overtime is assumed.
OP3	<u>Workforce</u> - Fluor Fernald will provide the operation support work force utilizing labor in accordance with the labor agreement between Fluor Fernald and the Fernald Atomic Trades and Labor Council (FAT&LC).

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ITEM NO.	DESCRIPTION
<b>SILO 3 OPERATIONS (Cont.)</b>	
OP4	<u>Sampling and Analysis</u> – A grab sample of Silo 3 material will be collected from the 10 yd <sup>3</sup> waste packages (Lift Liners™) and composited with other grab samples for final sample analysis. It is assumed that 111 samples will be analyzed for final waste acceptance.
OP5	<u>Sample Analysis</u> – Samples will be analyzed at an off-site laboratory for organics and reactive cyanides/sulfides. All other analyses will be performed at the onsite FEMP laboratory facility. A one-week turnaround time is assumed for all analyses.
OP6	<u>RMRS Support</u> – Per the settlement agreement, RMRS will supply up to 50 hours of technical support for operations. Additional technical support, if required, shall be at cost to Fluor Fernald.
OP7	<u>Reprocessing</u> – The project will assume that reprocessing of material that fails WAC will not be required. The cost of off-site reprocessing of failed material is included in the Silo 3 risk analysis. <del>Reprocessing material that fails WAC will be handled on a case by case basis. Reprocessing options will be assessed and planned, but will not be constructed unless the need arises.</del>
OP8	<u>Interim Storage</u> – Once processed to meet WAC, Silo 3 material will be moved directly from the packaging enclosure to the rail spur and loaded into gondola cars. WAC verification will be conducted in parallel with rail loading operations and assembly of the unit train. Gondola cars cannot be loaded in the rain. Therefore, three days worth of flat beds (6 flatbeds) will be secured to allow operations to continue in the event of rain. Lift Liners™ will be covered with tarps and the flatbeds staged in the Silos work zone during rain periods. It is assumed that this staging does not constitute storage and invoke radon flux requirements per 40 CFR 61.192.
OP9	<u>Surge Capacity</u> – Surge hoppers or tanks for Silo 3 material will not be required to maintain throughput. Operations will stop when material cannot be retrieved.
OP10	<u>Treated Waste Volume</u> – The treated waste volume of silo material is assumed to be 6,688 yd <sup>3</sup> , which accounts for material additives and bulking factors.
OP11	<u>Waste Production Rates</u> – In order to meet railcar loadout rates, an average of 3.5 Lift Liners™ must be produced per loading day. Equipment will be sized to produce 7 Lift Liners™ per day.
OP12	<u>Radiological Surveys</u> – One Th-230 smear per truck tire must be taken to allow release of the flat bed trucks from the loading area enclosure (18 smears per truck). Thorium-230 smears will require 2-5 minutes each to count before materials can be released.

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ITEM NO.	DESCRIPTION
<b>SILO 3 OPERATIONS (Cont.)</b>	
R1-D-205	<p>OP13 <u>Water Effluent</u> – Water effluent will be collected, sampled and analyzed prior to being released to the FEMP Advanced Waste Water Treatment (AWWT) System to ensure it – <del>The water effluent will</del> meets the AWWT acceptance criteria. The basis of estimate used for meeting the AWWT acceptance criteria is the following requirements:</p> <ul style="list-style-type: none"> <li>- 10 gallons per minute (gpm) maximum flow rate for OU4 in its entirety;</li> <li>- 1,000 ppm total suspended solids. (Total dissolved solids are not a concern because the 10-gpm waste stream will be significantly diluted by the much larger wastewater streams at the AWWT.)</li> <li>- metals and radionuclide concentration and quantities equal to or less than the discharge limits.</li> </ul>
<b>ENVIRONMENTAL PROTECTION</b>	
R1-D-844	<p>EP1 <u>Radon Monitor</u> – A radon monitor will be installed on the stack connected to the HEPA units.</p> <p>EP2 <u>HEPA Filter Testing</u> – HEPA filter testing and changeout will be performed onsite. Onsite HEPA testing includes leak testing and DOP testing. DOE Standard 320-97 is not considered a site requirement; therefore, Fluor Fernald has discontinued the practice of sending HEPA filters off-site for leak testing.</p> <p>EP3 <u>Offsite Impact</u> – The maximum allowable annual average off-site impact of radon within the work area is limited to 0.5 pCi/L per point source (above background.)</p> <p>EP4 <u>Stack Monitoring</u> - Continuous stack monitoring shall be required if emissions of radionuclide particulate material, excluding radon, are greater than 0.1 mrem/year.</p>
<b>MAINTENANCE</b>	
	<p>MT1 <u>Organization</u> – FAT&amp;LC maintenance craft will be used for performing maintenance on equipment, with the exception of vendor supplied equipment where vendors have been contracted to provide this service. FAT&amp;LC manpower will be shared with AWR. A separate maintenance crew will not be required for Silo 3.</p> <p>MT2 <u>Manpower</u> – In accordance with the union contract and safety culture, it is assumed that two personnel must be assigned for each craft performing work, but these personnel do not have to be the same craft.</p> <p>MT3 <u>Maintenance Scheduling</u> – The automated work package (AWP) system or adequate equivalent will be used for maintenance scheduling; however, Silo 3 will have project-specific approval for maintenance work orders. Silo 3 maintenance work orders will not be routed through the non-project support approval organizations.</p> <p>MT4 <u>Spare Parts</u> – The project will procure critical spare parts based on lead time and costs of components. A fully redundant spare part system will not be required. Equipment will be planned to run to failure.</p>

ITEM NO.	DESCRIPTION
<b>MAINTENANCE (Cont.)</b>	
MT5	<u>Maintenance Facilities</u> – A Silo 3 specific maintenance facility will not be required. If maintenance cannot be performed in the work area itself, then equipment will be moved to facilities constructed for AWR or Silos 1 and 2, or other areas onsite where maintenance capability exists.
MT6	<u>Maintenance Access</u> - Controlled access and egress is provided to all equipment requiring routine inspection and/or operation attention.
<b>PACKAGING SILO 3 MATERIAL</b>	
P1	<u>Disposal Facility Radiological Waste Acceptance Considerations</u> – Envirocare currently cannot roll-over rail cars with Th-230 concentrations greater than 4,000 pCi/g. This requires that Silo 3 material is packaged in a container Envirocare can roll-over or remove with a crane.
P2	<u>Lift Liners™</u> – Silo 3 material will be packaged in 8' x 7'-2" x 5', 24,000 lb. capacity Lift Liner™ containers to facilitate movement of Silo 3 material to the gondola rail cars and to facilitate handling at Envirocare. A modification to the liner (or an inner liner) will be made to allow cinching around a fill spout.
P3	<u>Contract</u> – Lift Liners™ will be obtained through the sole-source contract mechanism. It is assumed that 700 Lift Liners™ will be procured.
P4	<u>Price</u> – The price per Lift Liner™ is \$400 in FY01 dollars. An additional cost of \$100/Lift Liner™ is assumed to meet the FEMP QA quality level 3 requirements for fabrication (i.e., documentation of fabrication, shop QA program upgrades, etc.), including cost of Fluor Fernald QA overseeing fabrication.
P5	<u>Loading Frames</u> – Three loading frames will be rented during startup and an additional fifteen rented during Remedial Action (eighteen loading frames total during Remedial Action). Loading frames are rented for \$200 per frame per month. Costs are in FY01 dollars.
P6	<u>Onsite movement</u> – Three Lift Liners™ will be staged on a flat bed truck for filling. After filling and closing of the Lift Liners™, the flatbed truck will transport the Lift Liners™ to the rail loading area for shipment.
P7	<u>Rigging</u> – Two lifting frames will be purchased for \$5,200 per frame. Rigging of Lift Liners™ will only occur at the rail car loading area. Costs are in FY01 dollars.
P8	<u>Container Approval</u> – No special testing of Lift Liners™ will be required for use with Silo 3 material. A material compatibility determination will be made.
P9	<u>Absorbent Determination</u> – Absorbent will not be added to Lift Liners™ of Silo 3 material to support shipment. Lift Liners™ are not the shipment package, but a means of easily moving and containing Silo 3 material.
P10	<u>LSA Determination</u> – Packaging for the Silo 3 material (LSA-II) must, at a minimum, meet the design requirements for an industrial package – 2 (IP-2) container (49 CFR Part 173.411) and the design requirements for the Envirocare WAC.

ITEM NO.	DESCRIPTION
<b>PACKAGING SILO 3 MATERIAL (Cont.)</b>	
P11	<p><u>Radiation Levels During Transport</u> – The container will be designed to meet the following radiation level limitations under 49 CFR Part 173.441 during transportation:</p> <ul style="list-style-type: none"> <li>- 200 mrem/hr on the external surface of the package</li> <li>- 200 mrem/hr at any point on the outer surface of the transport vehicle</li> <li>- 10 mrem/hr at any point two meters from the outer lateral surface of the transport vehicle, excluding the top and underside of the vehicle</li> <li>- 2 mrem/hr in any normally occupied space</li> </ul>
<b>TRANSPORTATION OF SILO 3 MATERIAL</b>	
T1	<u>Transportation Mode</u> – Silo 3 material will be shipped via rail. Shipment of Silo 3 material will be concurrent with shipment of waste pits material on the same unit train. Additional cars for Silo 3 material will be added to the unit train. The unit train is currently approved to carry up to 60 rail cars of waste.
T2	<u>Shipment Schedule</u> – Shipments of Silo 3 material must be completed by <del>January</del> February 2005 <del>October 2004</del> to meet the WPRAP completion schedule.
T3	<u>Rail Cars</u> – Silo 3 material will be shipped in DOE-owned gondola cars. The existing FEMP rail car supply will be adequate to support Silo 3 shipment. No rail cars will be purchased or leased for this project.
T4	<u>Rail Car Liners</u> - Rail car liners will have to be purchased for gondola cars containing Silo 3 material. 100 rail car liners would be required. The price per rail car liner is \$198 in FY01 dollars.
T5	<u>Loading</u> – Silo 3 material will be loaded into gondola cars using a crane. Seven Lift Liners™ will be loaded per gondola car. Loading will performed on an existing rail line with existing access (such as the Track 12 extension, using the Haul Road to sit the crane). Little or no infrastructure modifications will be required. No cover will be constructed over the loading area; loading will be performed in the open.
T6	<u>Lidding</u> – Lids will be placed on the rail cars after loading, using the crane and a spreader bar. The IT Group (IT) owns the gondola car lids. Railcar lids can be leased from IT for \$360.50 per month.
T7	<u>Rail Car Weight Limit</u> - The gondola railcars have a 286,000 lb. weight limit for shipment. It is assumed that at 100% bag filling, a railcar filled with Silo 3 material will weigh only 51% of that limit.
T8	<u>Weighing Gondola Cars</u> – Rail cars will not be required to be weighed for shipment. The weight of each Lift Liner™ will be determined using a Dynalink crane scale attached to the crane rigging and the total weight of the gondola car figured by summing the weight of all the Lift Liners™ in that gondola car.

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ITEM NO.	DESCRIPTION
<b>TRANSPORTATION OF SILO 3 MATERIAL (Cont.)</b>	
T9	<u>Administration</u> – Administration of the rail shipment program remains part of the WPRAP operations. Documentation (e.g., manifests, placarding) to ship Silo 3 rail cars as part of the unit train will be prepared under the existing WPRAP program. No new procedures or personnel will be required. Data packages for treated Silo 3 material will be provided to WPRAP personnel by Silo 3 Project personnel.
T10	<u>CSX Contract</u> – A contract modification will be obtained with CSX to allow shipment of Silo 3 material under the existing CSX contract. The basis price for shipment is assumed to be \$9,406/ rail car based on the U.S. DOE Rail Tender. DOE will pay the costs to modify the rail tender; however, Fluor Fernald pays the cost of shipping the railcars.
T11	<u>IT Contract</u> – Two modifications will be obtained to IT's existing contract. IT technical support will be obtained during the Remedial Design phase to ensure the Silo 3 design will adequately support shipment by rail. During Operations, the contract will be modified to allow Fluor Fernald to lease rail car lids from IT for the railcars containing Silo 3 material.
T12	<u>Shielding</u> - The Silo 3 container will meet 49 CFR 173.441 requirements. <del>shielding necessary to achieve the DOT shipping requirements will be provided by the gondola car.</del>
T13	<u>Railcar Decontamination</u> – Per 49 CFR 173.433(d)(3) [Contamination Control], shipment of gondola cars is allowed without decontamination of the cars as long as the lids are on the railcar, except during loading and unloading of the gondola car.
<b>DISPOSAL OF SILO 3 MATERIAL</b>	
D1	<u>Disposal Volume</u> – 6,688 yd <sup>3</sup> of Silo 3 material will be disposed. This is based on the disposal of 700 Lift Liners™, containing 258 ft <sup>3</sup> (9.55 yd <sup>3</sup> ) of material per container.
D2	<u>DOE Responsibilities</u> – Silo 3 material will be disposed at Envirocare of Utah under the Army Corp of Engineers contract. The DOE will obtain an interagency agreement with the Corps of Engineers and accomplish all necessary negotiations with the Corp of Engineers to allow use of the Corps contract.
D3	<u>Disposal Price</u> – A rate of \$149.00-115.18/yd <sup>3</sup> will be charged for disposal of Silo 3 material. Should the waste be non-conforming, a rate of \$9.26/ft <sup>3</sup> (\$250.02/yd <sup>3</sup> ) would be charged for disposal. It is assumed that 6,688 yd <sup>3</sup> of Silo 3 material will be disposed of at the \$149.00-115.18/yd <sup>3</sup> price. Disposal costs are included as DOE costs.
D4	<u>Waste Characterization</u> – Envirocare characterizes Silo 3 material as pre-1978 generated 11e(2) material. <del>Envirocare is requesting permission from the State of Utah to dispose this type of material in their low level waste (LLW) cell.</del>

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R1-D-209

R1-D-210

ITEM NO.	DESCRIPTION
<b>DISPOSAL OF SILO 3 MATERIAL (Cont.)</b>	
R1-D-210 D5	<u>Disposal Cell</u> – Silo 3 material will be disposed in the Envirocare LLW (class A) or 11e(2) cell in accordance with Nuclear Regulatory Commission (NRC) license requirements. Pricing is calculated based on this assumption. <del>Disposal in either cell will not cause additional treatment requirements for Silo 3 material, beyond those discussed in these assumptions. Silo 3 material will not have to be handled as mixed waste, or treated as similar to mixed waste for purposes of disposal.</del>
R1-D-210 D6	<u>Disposal Facility WAC</u> – The Envirocare WAC for disposal in the LLW (class A) cell requires that the Silo 3 material radiologically be classified as “class A” waste, contain less than 10% enrichment, and have U-235 concentrations below 19,000 pCi/g. The WAC for the LLW cell requires that Th-230 levels in Silo 3 material be less than 150,000 pCi/g.  <del>The main radiological consideration of the Envirocare WAC for disposal in the 11e(2) cell is Th-230. The WAC requires that Th-230 levels in Silo 3 material be less than 60,000 pCi/g.</del>
D7	<u>Envirocare Infrastructure</u> – No additional infrastructure will be required at Envirocare to handle the 10 yd <sup>3</sup> Lift Liner™ containers. Envirocare currently possesses an 80 ton crane, which can accomplish movement of the bags. Radiological control requirements at Envirocare will not increase the disposal rate.
D8	<u>Rail Car Turnaround</u> – Envirocare can unload and turnaround rail cars in the same time required to turn around WPRAP rail cars.
<b>SHUTDOWN</b>	
SH1	<u>Gross Decontamination</u> - Equipment will be rinsed for decontamination purposes.
SH2	<u>Decontamination of Silo</u> – The silo will be washed down and then sprayed with fixative to “lock-down” contamination.
<b>DISMANTLEMENT</b>	
DD2	<u>On-site Disposal Facility (OSDF)</u> - 90% of debris generated from the shutdown of remediation equipment can be placed directly into the OSDF. Debris will meet the WAC, and the OSDF will open for placement of thorium-contaminated debris.

The following assumptions are applicable specifically to the blending of fissile compounds for the Nuclear Materials Disposition (NMD) Project.

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**TABLE 1-2.1a**  
**SUMMARY OF ASSUMPTIONS — FISSILE COMPOUNDS**

ITEM NO.	DESCRIPTION
<b>NUCLEAR MATERIALS DISPOSITION</b>	
FC1	<del><u>Drum Delivery</u></del> NMD will deliver one safe mass [approximately four (4) drums] per hour of fissile compounds during each work shift.
FC2	<del><u>Silo 3 WAC</u></del> Silo 3 will develop a WAC detailing waste it will accept for blending in the Silo 3 treatment process.
FC3	<del><u>Drum Inspection</u></del> NMD will inspect drums of fissile compounds to ensure contents meet the Silo 3 WAC prior to delivery of drums to the Silo 3 Project.
FC4	<del><u>Soil Stockpile</u></del> NMD will deliver soil for blending with fissile compounds to a stockpile between Silos 3 and 4.
FC5	<del><u>Soil Transfer</u></del> The Silo 3 Project will transfer soil for the stockpile to the treatment process for blending operations.
FC6	<del><u>Fissile Exempt Requirements</u></del> NMD will provide the formulations for each set of drums to ensure blended material complies with fissile exempt requirements under 49 CFR Section 173.453 (d) and the Envirocare of Utah WAC.
FC7	<del><u>Fissile Compounds Documentation</u></del> NMD will provide the necessary documentation to allow blending of NMD fissile compounds in the Silo 3 treatment process. Preparation of this documentation will be managed under PBS-08. Any documentation relating to the processing of the material will be provided by the Silo 3 Project (i.e., training, operating procedures, SOTs).
FC8	<del><u>Criticality Concerns</u></del> The fissile compounds provided by NMD will be in a safe configuration that will not present a criticality concern.
<b>NUCLEAR MATERIALS DISPOSITION (Cont.)</b>	
FC9	<del><u>Fire Hazards</u></del> The fissile compounds provided by NMD will not present any additional fire hazards than those identified in the Silo 3 Fire Hazard Analysis.
FC10	<del><u>Surrogate</u></del> 50 surrogate drums and soil will be provided by NMD for start up testing. Preparation of surrogate and soil will be managed under PBS-08. Surrogate runs on the Silo 3 treatment process will be managed under PBS-07.
FC11	<del><u>Transfer to NMD</u></del> Blended fissile compounds will be placed in dump trucks and transferred to NMD for transportation and disposal at Envirocare of Utah.
FC12	<del><u>Operating Shifts</u></del> Fissile Compounds Operations will be conducted on 2 shifts, 10 hours/day each, 4 days/week for 44 days at 70% plant availability. A skeleton third shift will also be required for clean-out. Additional resources will be brought in to support these additional shifts and will be released following completion of Fissile Compounds Operations.
FC13	<del><u>NMD Technical Support</u></del> NMD personnel will provide technical support for the development of procedures and other operations documentation developed by the Silo 3 Project. NMD personnel will charge this work to PBS-08.
FC14	<del><u>Fissile Compounds Secondary Waste</u></del> Disposition of secondary waste generated from Fissile Compounds blending is excluded from this scope.

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ITEM NO.	DESCRIPTION
EC15	<del>Decontamination</del> — No decontamination effort is assumed after the completion of Fissile Compound Operations, prior to the start up of Silo 3 retrieval and treatment.

### 1.2.2 Exclusions

In addition to the assumptions described above, there are several items that are excluded from the Silo 3 scope of work (SOW). Table 1-2.2 identifies those exclusions:

TABLE 1-2.2  
SUMMARY OF EXCLUSIONS

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ITEM NO.	DESCRIPTION
EX1	<del>DOE Order 413.3</del> — DOE Order 413.3, Paragraph 8.d, is applicable to capital assets, such as land, structure, equipment and information technology (e.g., hardware, software, and applications) used by the Federal Government that are estimated to have a useful life of two years or more. Since the project has an operational life of only one year, DOE Order 413.3 requirements will not be applied to the Silo 3 Project.
EX2	<del>DOE HQ Approvals</del> — No DOE HQ approvals will be required for Silo 3 work.
EX3	<i>Dismantlement of Silo 3 and Facility</i> — Decontamination and Dismantlement (D&D) is excluded from this scope. This work will be performed by the Silos 1 & 2 Project.
EX4	<i>Soil</i> — Remediation of soil and at- and below-grade equipment or foundations are excluded from this scope of work.
EX5	<i>FEMP Infrastructure</i> — Fluor Fernald will maintain necessary FEMP infrastructure, utilities, and general support functions such as the Emergency Operations Center (EOC), AWWT System, Medical, Security, Fire Department, and Human Resources. These expenses are not included in the project baseline.
EX6	<i>Disposal</i> — Disposal of Silo 3 material is not included in the Silo 3 baseline. Disposal is a DOE cost.
EX7	<i>Snow Removal</i> — Fluor Fernald will be responsible for snow removal from all FEMP roadways, sidewalks, and parking lots including the Silo 3 work area at no cost to the project.
EX8	<i>Boundary Monitors</i> — Air sampling and monitoring at the FEMP site boundary and existing on-site monitoring outside of the Silo 3 Project boundary will be the responsibility of Fluor Fernald, at no cost to the project.

ITEM NO.	DESCRIPTION
EX9	<i>Other FEMP Remediation Needs</i> – During conceptual design, other FEMP remediation needs that can be addressed using the Silo 3 equipment will be identified. The equipment and design for these other FEMP project functions are not included in the Silo 3 baseline.
EX10	<del><i>Fissile Compounds Documentation</i></del> – Preparation of the documentation to allow blending of NMD fissile compounds in the Silo 3 treatment process will be managed under PBS-08 (NMD). This includes any documentation required for approval of this path forward, safety documentation, Nuclear Safety Operational Authorization/Nuclear Criticality (NSOA/NC) documentation, documentation related to the Envirocare WAC for Fissile Compounds, etc.
EX11	<del><i>Fissile Compounds Support</i></del> – All technical and administrative support for the NMD activities will be charged to PBS-08.
EX12	<del><i>Fissile Compounds Surrogate</i></del> – Surrogate drums and soil will be provided by NMD. Preparation of surrogate and soil will be managed under PBS-08.
EX13	<del><i>Fissile Compounds Transfer</i></del> – The transfer of blended fissile compounds to the WPRAP facility, including equipment to transfer the material and monitoring of the transport route, will be managed under PBS-08. Transfer of fissile compounds to the Silo 3 facility, including any work to prepare the material to meet the WAC of the Silo 3 facility will be performed by PBS-08 and is excluded from this scope.
EX14	<del><i>Fissile Compounds Transportation and Disposal</i></del> – All expenses for handling, loading, sampling and analysis, rail transport, and disposal at Envirocare are covered under PBS-05 (WPRAP).

### 1.2.3 Government Furnished Equipment/Services

During the execution of the Silo 3 Project, it is anticipated that government furnished equipment (GFE) will be required. Table 1-2.3 identifies the GFE assumed for the Silo 3 Project, including the dates the equipment is projected to be needed. Table 1-2.4 identifies the government furnished services (i.e., utilities, disposal).

**TABLE 1-2.3**  
**SUMMARY OF GOVERNMENT FURNISHED EQUIPMENT**

QNTY.	DESCRIPTION	SCHEDULE	
		START	END
4	Front-End Loader (3-4 yd. bucket capacity)	Conduct SOT December 2002	Complete Fissile Compounds Operations July 2003
14	Jersey Barriers	Conduct SOT December 2002	Complete Fissile Compounds Operations July 2003
1	Yard Tractor	Conduct SOT December 2002 December October 2003	Complete Shipping November 2004 April February 2005

R1- F07- 025	QNTY.	DESCRIPTION	SCHEDULE	
			START	END
R1- F07- 059	6	Flatbed Trailers	Conduct SOT <del>December 2002</del> December October 2003	Complete Shipping <del>November 2004</del> April February 2005
	1	Crane (35 ton capacity)	Conduct SOT <del>December 2002</del> December October 2003	Complete Shipping <del>November 2004</del> April February 2005
	--	Rigging Shackles/Chokers	Conduct SOT <del>December 2002</del> December October 2003	Complete Shipping <del>November 2004</del> April February 2005
	1	Dynalink Crane Scale (50 lb. capacity)	Conduct SOT <del>December 2002</del> December October 2003	Complete Shipping <del>November 2004</del> April February 2005
	1	Fork truck (9,000 lb. capacity)	Conduct SOT <del>December 2002</del> December October 2003	Complete Shipping <del>November 2004</del> April February 2005
	4	Hi-Volume Samplers	Conduct SOT <del>December 2002</del> December October 2003	Complete Shipping <del>November 2004</del> April February 2005
	1	Passenger Vans (10-12 passengers)	September 2003	Project Completion <del>February 2005</del> June 2005
	1	Bus (30-40 passengers)	September 2003	Project Completion <del>February 2005</del> June 2005
	400	Tyveks (during Startup)	Conduct SOT <del>December 2002</del> December October 2003	Complete ORR <del>October 2003</del> January February 2004
	400	Rubber Booties (during Startup)	Conduct SOT <del>December 2002</del> December October 2003	Complete ORR <del>October 2003</del> January February 2004
	1	WPRAP Yard Locomotive	Conduct SOT <del>December 2002</del> December October 2003	Complete Shipping <del>November 2004</del> April February 2005
	100 (5 per train)	Gondola Cars	Start Silo 3 Operations <del>November 2003</del> March February 2004	Complete Shipping <del>November 2004</del> April February 2005

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QNTY.	DESCRIPTION	SCHEDULE	
		START	END
2	Roll-Off Boxes	Start Silo 3 Operations November 2003 <del>March</del> February 2004	Complete Shipping November 2004 <del>April</del> February 2005

**TABLE 1-2.4**  
**SUMMARY OF GOVERNMENT FURNISHED SERVICES**

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SERVICE	DESCRIPTION	COST
Utilities	Electric, Water, Sewer	Included in PBS01 Baseline.
Disposal	\$6,688 yd <sup>3</sup> @ \$149.00 <del>115.18</del> /yd <sup>3</sup>	\$996,512 <del>770,324</del>

#### 1.2.4 Submittals to DOE

Silo 3 documents requiring DOE review and approval have been identified in this Closure Plan. Subsequently, the duration of the DOE review and approval cycles is also identified by this Closure Plan and has been incorporated into the Silo 3 baseline schedule. The following text summarizes the Silo 3 document submittal process involving DOE:

- Silo 3 documents requiring DOE review and approval will be formally transmitted to DOE by Fluor Fernald.
- DOE will submit all review comments and document approvals to Fluor Fernald within the designated cycle.
- The Silo 3 Project team will assess DOE's comments to determine which organization should prepare a response.
- If comments require clarification or amplification, Fluor Fernald will notify DOE.
- The Silo 3 Project team will provide a comment response document to DOE, which will provide for each comment, a restatement of the comments, a response to the comment, and an identification of the action to be taken on the document to reflect the response.
- It may or may not be necessary to submit a revised document following the comment response document. Change pages may be submitted in lieu of a complete revision of the document or submittal.

#### 1.2.5 Submittals to USEPA/OEPA

The following discussion identifies the submittal process to the USEPA and OEPA:

- Documents requiring USEPA and OEPA review and approval will be provided to DOE for review and approval in accordance with this Closure Plan.
- Upon approval by Fluor Fernald and DOE, DOE will provide the document to the USEPA and OEPA for concurrent review and approval.
- Fluor Fernald will allow 60 calendar days for concurrent reviews by USEPA/OEPA.
- USEPA/OEPA will provide written comments to DOE, who upon receipt, will in turn provide the comments to Fluor Fernald for resolution.
- Fluor Fernald will assess the USEPA/OEPA's comments to determine which organization should prepare the draft response.
- If any review comments require clarification, Fluor Fernald will notify DOE and/or contact the USEPA/OEPA directly (with concurrence of DOE).
- Fluor Fernald will prepare a draft comment response document. The response to comments document will be in a traditional format and will provide for each comment: a restatement of the comment, a proposed response to the comment, and an identification of the action to be taken on the document to reflect the proposed response.
- It may or may not be necessary to submit a revised document along with the comment response document to the EPAs. Change pages may be submitted by Fluor Fernald in lieu of a complete revision of the deliverable.
- To assist the EPAs with comment resolution, Fluor Fernald will provide a copy of the final comment responses, final comment resolutions and a "redline/strikeout" version of the document, as appropriate, indicating all changes made to the document.
- Fluor Fernald will allow the EPAs 30 calendar days from their receipt of the comment response document and revised documentation to review and approve the document, or provide additional comments.
- Upon receipt of USEPA/OEAP written approval, Fluor Fernald will begin implementation of the activities identified in the approved document.

It is assumed that all meetings with the USEPA and OEPA will be conducted at the FEMP related to the resolution of comments on Silo 3 deliverables. Therefore, no travel budget has been included in this Closure Plan for this effort.



R1-D-061 1.2.6 DOE Order 413.3

R1-D-212 The schedule and resource planning for the Silos 3 Project is based upon the following project management strategy to comply with DOE Order 413.3. The principal goal of DOE Order 413.3 is to ensure that DOE delivers capital assets on schedule, within budget, fully capable of meeting mission performance and environmental, safety, and health standards and in compliance with ARARs and TBCs. Many aspects of the project management process identified by DOE Order 413.3 are already embedded within existing FEMP Programs and Procedures, and are identified as Fernald Closure Contract (DE-AC24-01OH20115) requirements.

The Silo 3 Project team has developed a tailored approach consistent with the intent of DOE Order 413.3 by integrating the following activities into the Silo 3 Project baseline:

- Critical Decision Points; and
- Independent Review.

R1-D-061 The following section discusses how these components of DOE Order 413.3 will be used to strengthen this project.

R1-D-212 Critical Decision Points

DOE Order 413.3, Chapter I, defines a critical decision as "...a formal determination or decision at a specific point in a project phase that allows the project to proceed to the next phase and commit resources." The Silo 3 Project has adopted the following Critical Decision (CD) milestones for traditional projects, as proposed by DOE-FEMP.

- CD-0, Identification of Project Need (complete)
- CD-1, Approval of Preliminary Baseline (complete)
- CD-2, Approval of Performance Baseline
- CD-3, Approval to Start Construction
- CD-4, Approval to Start Operation

No additional submittals to DOE will be required specifically to meet the requirements of DOE Order 413.3. The independent review function identified in DOE Order 413.3 will be satisfied by the DOE Critical Analysis Team (CAT) review of the Conceptual Design Package and Final Design Package. CD-4 will be met through the DOE ORR for startup of the Silo 3 facility.

Work will proceed in parallel with DOE CAT review of the conceptual design and final design packages. Upon Fluor Fernald review of the Conceptual Design Package, Fluor Fernald will commence preliminary design activities. Fluor Fernald will also commence bid and award of construction contracts during DOE review of the Final Design Package. Operations, however, will not commence until completion of the DOE ORR.

### 1.3 DRIVERS

#### 1.3.1 HS3AA - Project Management

No drivers are identified.

#### 1.3.2 HS3AB - Remedial Design Documentation

No drivers are identified.

##### 1.3.2a HS3AK – Conceptual Design – Fluor Fernald

No drivers are identified.

##### 1.3.2b HS3AL – Conceptual Design – Jacobs

No drivers are identified.

##### 1.3.2c HS3AM – Preliminary Design – Fluor Fernald

No drivers are identified.

##### 1.3.2d HS3AN – Preliminary Design – Jacobs

No drivers are identified.

##### 1.3.2e HS3AP – Final Design – Fluor Fernald

No drivers are identified.

##### 1.3.2f HS3AR – Final Design – Jacobs

No drivers are identified.

##### 1.3.2g HS3AS – Title III Support – Fluor Fernald

No drivers are identified.

##### 1.3.2h HS3AT – Title III Support - Jacobs

No drivers are identified.

#### 1.3.3 HS3AC - Construction Management

No drivers are identified.

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#### 1.3.4 HS3AD - Subcontracts

No drivers are identified.

#### 1.3.5 HS3AE - Startup/Startup Review

No drivers are identified.

#### 1.3.6 HS3AF - Remedial Action

The only drivers for the Silo 3 Project are in the Remedial Action task. Below are those drivers:

- Silo 3 production is constrained by the number of railcars WPRAP can dedicate to Silo 3 per unit train. Five railcars per unit train can be dedicated for Silo 3 material. Unit trains are shipped every 2.5 weeks, which equates to 2 railcars per week released from WPRAP for use on the Silo 3 Project. This dictates that Silo 3 can only produce fourteen Lift Liners™ per week (3.5 per day).
- Loading of gondola cars with treated Silo 3 material cannot be performed during periods of rain. Therefore, weather is a significant driver during operations.
- Silo 3 remediation must be complete prior to ~~January~~ February 2005 to allow shipment of Silo 3 material on the unit train. If this is not accomplished, then the cost savings realized by utilizing the existing rail infrastructure is lost.

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#### 1.3.7 HS3AG - Shipping

No drivers are identified.

#### 1.3.8 HS3AH - Shutdown

No drivers are identified.

### 1.4 PROJECT PHYSICAL DESCRIPTION

The overall objective for the Silo 3 Project is the safe removal, stabilization, transportation and disposal of Silo 3 material to meet the WAC of an off-site disposal facility, in a safe, timely, efficient, and cost-effective manner. Silo 3, which is a component of OU4, contains an estimated 5,088 yd<sup>3</sup> of metal oxide material generated from the operation of the former Feed Materials Production Center, now known as the FEMP. The predominant radionuclide of concern identified within the material is Th-230, a radionuclide produced from the natural decay of uranium-238 (U-238). Silo 3 material is classified as 11(e)(2) by-product material under the AEA of 1954, as amended, and contains several RCRA

metals. The ROD established that some RCRA requirements are relevant and appropriate for management and remediation of the waste. However, Silo 3 material is exempt from regulation under RCRA due to its classification as 11(e)(2) by-product material.

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~~In addition to the remediation of Silo 3 material, the Silo 3 facility will be used to blend fissile compounds from NMD with soil, to meet DOT shipping requirements and the Envirocare WAC. NMD will deliver approximately 2,450 drums of fissile compounds to the Silo 3 Project. In addition, NMD will provide the soil necessary for blending operations. The Silo 3 Project will blend fissile compounds with soil and transfer blended material to a dump truck provided by NMD. Dump trucks of blended material will then be transferred to NMD for transportation and disposal at Envirocare. Transfer of blended material by dump truck from the Silo 3 Project to the WPRAP facility will be managed under PBS-08 (NMD). Transportation and disposal activities, including sampling and confirmation analysis, will be managed under PBS-05 (WPRAP).~~

~~Blending operations will be performed prior to remediation of Silo 3 material to prevent the need for working in a thorium-contaminated area and provide operating experience prior to treatment of Silo 3 material. Only one safe mass of fissile compounds will be transferred at one time to the Silo 3 Project at any time to prevent criticality concerns. Blending will be performed to reduce the concentration of Uranium-235 to less than 0.5 grams per liter and meet fissile-exempt shipping requirements under DOT 49 CFR Section 173.453(d) and the Envirocare WAC.~~

The treatment of the Silo 3 material will be conducted in accordance with the clean-up objectives and requirements identified in the ESD for Silo 3. The ESD identified chemical stabilization/solidification and polymer encapsulation as acceptable stabilization options. These stabilization options involve the mixing of Silo 3 material with a variety of chemical additive formulations to accomplish chemical and physical binding of the constituents of concern (COCs). These options provide reduction in contaminant mobility by chemically stabilizing contaminants into a leach-resistant form, as well as physically binding the chemically stabilized contaminants in a solid matrix.

In parallel to the performance of the Silo 3 Project, there will be project activities occurring adjacent to the north, south, east, and west of the Silo 3 work zone area under separate projects. The following is a list of known adjacent or collocated projects that will be conducted during the performance of the Silo 3 Project:

- AWR Project - This project will be performed to the south of Silo 3 and will involve the removal and transfer of the Silos 1 and 2 material to a transfer tank area south of Silos 1 and 2. An overhead pipe rack and transfer lines will be constructed through the Silo 3 work zone to support non-radiological waste transfer mock-up tests at Silo 4.
- Silos 1 & 2 Project – This project will be performed south of Silo 3. Silos 1 and 2 activities conducted during the performance of the Silo 3 Project will include construction of the Silos 1 and 2 facilities.

- Environmental Monitoring- This project involves monitoring in support of the Silos 1 & 2 Project and will be performed to the west of Silo 3.
- WPRAP - This project bounds the Silo 3 Project work zone on the North and East and involves the remediation of the OU1 waste pits.

The development of the Silo 3 Project safety basis documentation shall be coordinated with these projects, ~~as well as NMD~~. Unreviewed safety questions (USQs) may arise between the projects whose resolution must not only be integrated into the approved safety basis for the Silo 3 Project, but each other projects' safety basis as well. In addition to the projects mentioned above, the Silo 3 Project will also coordinate with any projects requiring use of the Haul Road areas to be utilized for loading of railcars.

The complete Silo 3 scope of work will be accomplished through the following tasks and subtasks:

#### 1.4.1 HS3AA - Project Management

The scope of the project management task consists of those project-related activities which are needed to support the implementation of the Silo 3 Project, and the documentation required, under the terms of the Site Closure Contract, to demonstrate the ability to execute the Silo 3 Project. The Project Management scope of work is defined by three project subtasks to be conducted by Fluor Fernald:

- 1) Project Management
- 2) Project Management Documentation
- 3) Project Closure

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#### 1.4.2 HS3AB - ~~Remedial~~ Design Documentation – Fluor Fernald

The scope of ~~Remedial~~ Design Documentation (Fluor Fernald) consists of development of engineering, safety and regulatory documentation that is necessary to support design of the Silo 3 treatment process and facilities, ~~from conceptual through final design phases~~. Design Documentation includes the following subtasks:

- 1) Design Data Development
- 2) Remedial Design Package
- 3) Preliminary Hazard Analysis Report
- 4) Health and Safety Plan/Health and Safety Requirements Matrix

~~Remedial Design will be conducted primarily by a Fluor Fernald Silos Team, which consists of site personnel and team members from DFS and Jacobs. Independent consultants, specialty subcontractors, and university subcontractors will be utilized as needed.~~

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~~Configuration management activities during Title III engineering are also included in the Remedial Design scope. The Remedial Design includes the following subtasks:~~

- ~~1) Bench Scale Testing~~
- ~~2) Conceptual Design~~
- ~~3) Engineering Design Package (Preliminary)~~
- ~~4) Engineering Design Package (Final)~~
- ~~5) Remedial Design Package~~
- ~~6) Preliminary Hazard Analysis Report~~
- ~~7) Health and Safety Plan/Health and Safety Requirements Matrix~~
- ~~8) Title III Engineering Support~~

Remedial Design, which consists of Design Documentation, Conceptual Design, Preliminary Design, Final Design, and Title III Engineering Support will be conducted by an integrated team of Fluor Fernald Silos personnel and team members from DFS and Jacobs. Under this approach, Jacobs will be the Designer of Record and will provide Title III engineering services during construction and operations. Additionally, Jacobs will also prepare safety basis documents. Independent consultants and specialty subcontractors will be utilized as needed.

1.4.2a      HS3AK – Conceptual Design (Fluor Fernald)  
              HS3AL – Conceptual Design (Jacobs)

The scope of the Conceptual Design task includes identifying the basis for the design, including defining any required supporting engineering studies and special investigations, preparing and reviewing design documents and calculations, and establishing the technical baseline. The technical baseline is that collection of design basis and process information that is of sufficient detail to assure consistency of approach and process during subsequent design phases (Preliminary and Final Design). All of these activities will be performed as part of the following subtask:

1)      Conceptual Design

1.4.2b      HS3AM – Preliminary Design (Fluor Fernald)  
              HS3AN – Preliminary Design (Jacobs)

The scope of the Preliminary Design task includes controlling changes to the technical baseline, preparing and reviewing the preliminary design (including long-lead procurement specifications), performance grading and constructability reviews. All of these activities will be performed as part of the following subtask:

1) Preliminary Design

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1.4.2c      HS3AP – Final Design (Fluor Fernald)  
                 HS3AR – Final Design (Jacobs)

The scope of the Final Design task includes incorporating details of long-lead procurements and vendor-designed equipment, developing and reviewing detailed final design packages, and ensuring consistency and continuity with the safety basis documentation. All of these activities will be performed as part of the following subtask:

1) Final Design

1.4.2d      HS3AS – Title III Support (Fluor Fernald)  
                 HS3AT – Title III Support (Jacobs)

The scope of the Title III Engineering Support includes making the necessary changes to, and interpretations of, the design during construction and operations, approval of vendor submittals, and equipment inspections. All of these activities will be performed as part of the following subtask:

1) Title III Engineering Support

1.4.3      HS3AC - Construction Management

The scope of Construction Management consists of the activities necessary to support construction, including equipment procurement, reviews, infrastructure coordination, planning and bidding support, subcontract oversight, and acceptance testing. Fluor Fernald will act as the general contractor for construction of the Silo 3 remediation facility. The design and specifications of the construction scope will be divided into logical bid packages by discipline (i.e., civil, mechanical, and electrical). Fixed price contracts will be secured through an IFB process for each package. Construction Management consists of the following key subtasks:

- 1) Equipment Procurement
- 2) Invitation for Bid Preparation and Award
- 3) Subcontract Management
- 4) Construction Start-up Support

1.4.4      HS3AD - Subcontracts

Silo 3 construction will be performed by subcontractors using Greater Cincinnati Building and Construction Trades Council (GCBCTC) labor in accordance with the Project Labor Agreement (PLA). Subcontracts will be awarded for civil, mechanical and electrical work. Subcontractors will be required to obtain craft input to finalize safe work plans, and to perform the construction work in accordance with the established contracts. The following subtasks have been identified for the Subcontracts task:

- 1) Civil Contractor Fieldwork
- 2) Mechanical Contractor Fieldwork
- 3) Electrical Contractor Fieldwork

#### 1.4.5 HS3AE - Startup/Startup Reviews

The scope of the Startup/Startup Review task consists of those activities necessary to demonstrate that the project has been properly constructed and ready for operations and that the workforce has been properly trained and is ready to safely operate the facility. The Startup/Startup Review task includes project preparation and evaluation of personnel and qualifications, facility and process hardware, engineering and administrative controls, procedures and training against documented safety and design bases. Additionally the scope includes an evaluation of operational readiness by Fluor Fernald and a subsequent readiness evaluation by DOE-FEMP. ~~Fissile compounds blending will be accomplished during the start-up phase of Silo 3 Operations. However, an SSR will be performed prior to fissile compounds processing.~~ The Startup/Startup Review task consists of the following subtasks:

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- 1) Startup Management
- 2) Operating Procedures
- 3) Final Hazard Analysis Report
- 4) Maintenance Plan
- 5) Develop Pre-operations Training
- 6) Conduct Training
- 7) Develop System Operability Testing Procedures
- 8) Conduct System Operability Tests
- ~~9) Fissile Compounds Standard Startup Review~~
- ~~10) Fissile Compounds Operations~~
- ~~11) Prepare Silo 3 Operations~~
- ~~12) 9) Operational Readiness Reviews~~

#### 1.4.6 HS3AF - Remedial Action

The Remedial Action task consists of those activities necessary to operate the Silo 3 facility and processes for Silo 3 material. Remedial Action includes retrieval of Silo 3 material, treatment to meet the disposal facility WAC, and packaging and preparation for shipment. Facility ownership activities and utilities are also covered under this scope of work. All of these activities will be performed as part of the following subtask:

- 1) Operations

#### 1.4.7 HS3AG - Shipping

The scope of work for the Shipping task includes manifesting the Silo 3 waste, shipping the material to Envirocare, and disposal of treated Silo 3 material. The Shipping task also



includes those activities necessary to support the proper management and disposal of secondary waste generated during the Remedial Action. The Shipping task consists of the following subtasks:

- 1) Shipping
- 2) Disposal

#### 1.4.8 HS3AH - Shutdown

Fluor Fernald will perform shutdown activities to place the Silo 3 remediation and support facilities in a controlled state ready for dismantlement. The primary purpose of facility shutdown is to isolate all utilities to the facilities, remove gross quantities of hold-up from existing equipment, ductwork, pipes, and perform gross decontamination to prepare for dismantlement. Dismantlement of the Silo 3 facility, equipment and silo is excluded from this scope [Exclusion EX3]. Shutdown will be accomplished within the following subtasks:

- 1) Safe Shutdown Documentation
- 2) Safe Shutdown

### 1.5 PROJECT PLAN/TECHNICAL SCOPE AND QUANTIFICATION

The Technical Scope and Quantification provides a technical description of the activities comprising the Silo 3 Project. A complete list of deliverables and documents for the project is contained in Appendix B. Appendix C contains a list of the Functional Area documents to be used in the conduct of Silo 3 Project planning and work.

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~~The Silo 3 Project will involve the processing of fissile compounds and Silo 3 material. Fissile Compounds Operations will involve the receipt and blending down of fissile compounds from NMD (PBS-08) with soil. Blended material will be loaded into dump trucks and transferred back to NMD for transfer to the WPRAP facility. Transportation and disposal activities will be managed under PBS-08.~~

The approach to remediating Silo 3 material involves the retrieval and treatment of Silo 3 material and shipment of the material utilizing exiting resources at the WPRAP facility. A conceptual description of the implementation of this scenario is contained in the appropriate sections of this Technical Scope. The following conceptual figures and sketches are provided in Appendix D, in support of these descriptions:

- ~~SK-4229-01B, Silo 3 / NMD Project Civil Site Plan~~
- SK-4229-01, Silo 3 Project Civil Site Plan
- SK-4229-02, Silo 3 Project Floor and Equipment Plan
- ~~SK-4229-02B, Silo 3 / NMD Project Floor and Equipment Plan~~
- SK-4229-03, Silo 3 Project Section
- SK-4229-04, Silo 3 Project Lighting Plan
- ~~SK-4229-03B, Silo 3 / NMD Project Section~~
- ~~SK-4229-04B, Silo 3 / NMD Project Lighting Plan~~

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- 94X-5500-F-SK-XXXX, Process Flow Diagram, Silo 3 Chemical Stabilization
- ~~94X-5500-F-SK-XXXX, Process Flow Diagram, Silo 3/NMD Chemical Stabilization~~

Figure 1-1 presents an overview of the Silo 3 Project work scope, from Silo 3 Operations through Shutdown. Figure 1-2 presents, in detail, the conceptual remediation approach for Silo 3 material. The following sections describe the assumed process and facility requirements for the ~~both Fissile Compounds Operations and~~ Silo 3 Operations. Specific equipment, mass balance, and facility sizes, amongst other details, may change during the design process. However, this baseline and the cost estimate for completing the Silo 3 Project, is based on the following process and facility descriptions.

**INSERT FIGURE 1-1**

**INSERT FIGURE 1-2**

Process Description – Silo 3 Material

The processing of the Silo 3 material requires stabilization of the metals that failed TCLP in accordance with the ESD [Assumption R2]. The minimally acceptable formulation developed by RMRS for processing Silo 3 material would require 17% moisture, 3% Envirobond™ and 2% ferrous sulfate, on dry waste basis [Assumption RD13].

Envirobond™ will be provided by RMRS, in a quantity sufficient to treat 3,950 tons of Silo 3 material [Assumption RD9]. The bulk density of material for recipe formulation and treatment is assumed at 58 lbs/ft<sup>3</sup> and moisture content at 3.7 to 10.2 % [Assumptions G1, G2, G9]. The RMRS treatability study showed that the Envirobond™ process will stabilize RCRA metals of concern, arsenic, cadmium, chromium, and selenium [Assumption G5]. The binding process depends upon the characteristics of the metallic ions (strong Lewis acids) and the ligand (Envirobond™) (PO<sub>4</sub><sup>3-</sup>), which is a strong Lewis base through phosphate binder reactions resulting in insoluble complex forms. Ferrous sulfate addition is necessary as a reducing agent to stabilize chromium [Assumption RD10]. Water is added during the treatment process to promote mixing and reaction and to increase the moisture content of the dry Silo 3 material [Assumption G9].

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The need and ratios for the additives will be determined during design data development ~~bench-scale testing~~. The operating formulation developed during design data development ~~bench-scale testing~~ will be designed to eliminate the need for strict process controls during operations. These tests will be the basis for evaluating treatment against disposal facility WAC [Assumption RD3]. The treated material is planned for disposal at Envirocare. The Envirocare WAC for the LLW cell requires that the Silo 3 material thorium (Th-230) levels be less than 150,000 pCi/g or below 60,000 pCi/g in the 11(e)(2) cell [Assumption D6]. Because Silo 3 material was generated prior to 1978, the exact disposal cell at Envirocare for Silo 3 material is not known at this time. The assumption is no blending of the treated material is required to meet WAC acceptance for radiological characteristics.

The Silo 3 remediation process is divided into the following seven (7) systems:

- Mechanical Retrieval and Conveyance System.
- Pneumatic Retrieval System
- Mixing and Filling System
- Packaging and Transport System
- Process Building Ventilation System
- Additives system
- Process and Recycle Water System

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~~Process Description — Fissile Compounds~~

~~The processing of fissile compounds requires blending the material with soil to meet DOT fissile exempt requirements [49 CFR Section 173.453(d)], as well as the Envirocare WAC [Assumption FC6].~~

~~NMD will deliver one safe mass group (approximately 4 drums) of fissile compounds per hour to the Silo 3 Project [Assumption FC1]. NMD will also provide the soil to ensure the blended material meets the DOT fissile exempt requirements. Soil will be delivered by NMD to a stockpile between Silo 3 and Silo 4 [Assumption FC4]. The Silo 3 Project will move soil from the stockpile to the process facility for blending operations [Assumption FC5]. NMD will provide the Silo 3 Project with the blending formulation for each set of drums processed. One safe mass group will equal one batch. The Silo 3 Project will shred one drum of fissile compound followed by a separation step where metal drum fragments are removed for the waste prior to entering the mixer. The fissile compounds will then be blended with soil in a double ribbon blender and off loaded into a dump truck [Assumption FC11]. Four drums of blended fissile compounds will be placed in one dump truck. Metal drum fragments will be loaded into the dump trucks with each batch of blended fissile compounds.~~

~~The need and ratio of soil to fissile compounds will be determined by NMD through analytical data and process information. The Fissile Compounds Operations process will use the following four (4) systems:~~

- ~~• Drum Processing System;~~
- ~~• Metals Separation System;~~
- ~~• Mixing and Filling System; and~~
- ~~• Additives System.~~

~~Facility Requirements~~

~~The stabilization of Silo 3 material in accordance with the ESD, approved by the USEPA and Ohio EPA requires safe removal of the material from Silo 3 into a new retrieval and treatment facility [Assumption R2].~~

~~An undeveloped area approximately 132 ft. x 105 ft. is reserved for a new treatment facility to the north of Silo 3 (between Silo 3 and Silo 4). Construction in this area's (north boundary at N480905) must be coordinated with the construction and operation of AWR project's full-scale mock-up. The current schedule indicates potential interference between both projects' activities. East and west boundaries are E 1946940 and E1947072. There is limited space available west of Silo 3. The area west of Silo 3 and the infrastructure road has been developed with laydown space and operations trailers (T-414 and T-415).~~

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The Silo 3 Interim Storage Pad, an acre 9" thick reinforced concrete pad east of Silo 3 was constructed in FY2000. This area is the location for the treatment facility. The pad has catch basins and underground storm water drainage system. A pipe rack for the AWR mock-up is planned on the west edge of the pad. The pad has aprons to the new infrastructure road. A treatment facility containment as large as 100 ft by 60 ft. can be erected on the pad avoiding the cost of construction of a slab. Some modifications may be required such as leveling areas sloping to the catch-basins and curbs around the perimeter of the containment facility for spill control. Two sumps would be cut into the pad within the containment enclosure. To accommodate Silo 3 Operations, the treatment containment will house the following major equipment: conveyors transporting material from the silo to the mixer, batch mixer, water storage tanks, additives hopper and conveyor, and vacuum retrieval equipment. ~~To accommodate the additional scope of blending fissile compounds with soil under Fissile Compounds Operations, the containment will house the following additional major equipment: drum shredder, shredder vent hood, conveyor transporting fissile compounds to mixer, magnetic separator, and soil feeder and conveyor system. Potential future use of the facility would require space planning to allow installation of drum handling equipment, drum dumpers, and bulk handling of soils.~~

Locating this containment on the ISA pad would require a second containment joining the silo with the treatment facility. This retrieval containment would require a new slab and spill control measures such as foundation wall and sumps. The retrieval containment, approximately 35 ft. by 40 ft. will be large enough to house the excavation equipment such as an excavator planned for use for cutting opening into silo and retrieval [Assumption SA1].

The containment construction will be tension-support structures. Manufacturer's standard truss-design is assumed. Additional partition walls will be required for segregation of work areas. Roll-up doors will be required for large equipment access and pedestrian doors between rooms. The layout shows a maintenance aisle with access through double doors. Lighting will be required in all areas, as well as portable radiant heaters for winter work. The containment will be divided into work zones for contamination control and air exchanges [Assumption RD14]. Portable HEPA units would be located outside the enclosures to provide the appropriate ventilation and air filtration. The area with hoppers and mixers are expected to have contamination controls due to hold-up of radioactive material and will be separated from the clean area where additive addition will occur. The clean area would also contain utilities. To minimize permanent mechanical equipment and provide for flexible use of the facility, a "drive through" bay will be used for filling ~~dump trucks for Fissile Compounds Operations~~ and flatbed trailers and container filling on trucks for Silo 3 Operations, as required by the process. This bay will need to be maintained as clean or buffer area due to filling operation occurring here. Radiological surveys of containers and conveyance will occur in these bays for release to shipping location.

Any equipment requiring a control room environment can be installed in a portable trailer with climate control. Satellite change rooms will be provided through portable trailers, as

well. The main control point and locker room and toilet facilities are located in the T-92 complex.

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~~Fissile Compounds Operations are designed around batch mixing of drum contents and placement of blended material into dump trucks. Filled dump trucks will be transferred to NMD. NMD will transfer blended material from the Silo 3 facility to the WPRAP facility, which will be managed under PBS-08. Transportation and disposal activities, including sampling and confirmation analysis, will be managed under PBS-05.~~

Silo 3 Operations are designed around batch mixing and no or little interim storage of containers. The ISA pad has additional capacity, beyond the area utilized for the treatment containment, for the interim storage of trailers containing filled Lift Liners™. The turning radii of tractor and trailers must be considered. The north end of the pad has a sharp turning radius that may require additional modification. Unloading of flatbed trailers can occur while trailers are on the haul road, directly loading gondola cars on the maintenance rail spur. A crane pad will be required between the road and track. Additional road extensions may be required for the trailer turning radius from the infrastructure road to the haul road. Currently Second Street is only one lane south of the WPRAP facilities [Assumption OP8].

Two foundations northwest and southeast of Silo 3 were constructed for gantry foundations. These foundations currently have forms and gravel installed for pre-loading. The southeast foundation is considered a feasible location for installing a stack for the air filtration system.

Risk analysis identified failure of silo as a safety basis concern. Contingency planning considers installation of containment around the entire silo as a viable option. Such a containment would need to be approximately 100 ft. x 100 ft. to cover the 80 foot diameter silo.

A Silo 3-specific maintenance facility will not be required. If maintenance cannot be performed in the work area itself, then equipment will be moved to facilities constructed for AWR or Silos 1 and 2, or other areas onsite where maintenance capability exists [Assumption MT5].

Occupancy of the treatment facility during Silo 3 Operations will vary with the activities occurring. During cutting of the silo, subcontractor labor and support personnel will be in the retrieval containment for the duration of the cutting activity. During operations, retrieval equipment is planned for remote operation from the control trailer; however, daily equipment inspections are currently required. Operation of the treatment equipment can be done from a local control panel placed in a non-contaminated area and requires few operating personnel. Additives will require handling of bulk bags or paper bags. Packaging requires hands-on interaction for securing the fill tube to the container liner, closing the container, and performing radiological surveys. Transportation personnel will deliver additives and drive flatbed trailers round-trip from the facility and to railroad. Daily



samples for waste acceptance is required. The manpower numbers in Table 1-5.1 are for **occupancy** of the treatment facility during Silo 3 Operations. The manpower numbers used for the total project are greater due to back-up, support, etc. Total manpower requirements for operations are discussed in Section 1.5.6.

**TABLE 1-5.1  
OCCUPANCY OF TREATMENT FACILITY  
DURING SILO 3 OPERATIONS**

ACTIVITY	CRAFT	F/T, P/T
Cutting of silo	Construction	4 F/T
Operate excavating equipment	HEO	2 F/T
Operate vacuum retrieval	Hazwat	2 P/T
Operate mixing equipment	Chemical operator	2 F/T
Additives addition	Chemical operator	2 F/T
Packaging & Sampling	Hazwat	4 F/T
Radiological Support	Radiological Control Technician	2 F/T

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~~Occupancy of the treatment facility during Fissile Compounds Operations will vary with the activities occurring. Operation of the treatment equipment can be done from a local control panel placed in a non-contaminated area and requires few operating personnel. Transportation personnel will deliver containers of fissile compounds and soil and transport blended material from the facility to the railroad. Radiological surveys will need to be performed on dump trucks prior to release from the facility. Table 1-5.1a presents the manpower numbers for **occupancy** of the treatment facility during Fissile Compounds Operations. Total manpower requirements for Operations are discussed in Section 1.5.5, Task #10.~~

**TABLE 1-5.1a  
OCCUPANCY OF TREATMENT FACILITY  
DURING FISSILE COMPOUNDS OPERATIONS**

ACTIVITY	CRAFT	F/T, P/T
Operate shredder and magnetic separator	Hazwat	2 P/T
Operate mixing equipment	Chemical operator	2 F/T
Additives addition	Chemical operator	2 F/T
Packaging & Sampling	Hazwat	1 F/T
Radiological Support	Radiological Control Technician	2 F/T
Drum delivery	MVO	1 P/T

**Inputs and Outputs — Fissile Compounds Operations**

~~The primary stream during Fissile Compounds Operations is drums of fissile compounds from NMD. Soil will be used to blend the concentration of U-235 down to meet DOT~~

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~~shipping requirements for fissile exempt material under 49 CFR Section 173.453(d) and to meet the Envirocare WAG. In addition, water may be added to the blending process to ensure the moisture content meets the Envirocare WAG.~~

~~NMD estimates there are 2,450 drums of fissile compounds requiring blending. It is estimated that four drums of fissile compounds can be blended in one hour, with 28 drums being processed per workshift. At two workshifts per day, this results in 56 drums processed per day. Operating four days per week results in 224 drums processed per week. The processing of 224 drums of fissile compounds per week results in approximately eleven weeks of Fissile Compounds Operations.~~

~~Four drums of fissile compounds blended with soil will comprise one dump truck load. Processing 2,450 drums of fissile compounds will result in 613 dump truck loads being produced.~~

#### Inputs and Outputs – Silo 3 Operations

The primary streams in the Silo 3 Operations are the bulk Silo 3 material feed, water, Envirobond™, and ferrous sulfate. The use of absorbent or binding agent to cause agglomeration of Silo 3 material to reduce dusting, and prevent release of free liquids during transport is to be determined [Assumption RD11].

The Silo 3 material feed streams will be a ratio from bulk excavation and pneumatic retrieval. Water feed streams will have make-up water and recycled (wash or sump) water inputs. Debris is considered to be approximately one ton and can be segregated from the treatment process. Final container waste volume and the waste profile will allow disposal of debris, PPE, and HEPA filters with the treated waste.

Inputs from the ventilation system will be from filter loading based on twelve air exchanges per hour. The following assumptions are used for this baseline:

Volume of Silo 3 Material	137,700 ft <sup>3</sup>
Maximum Density	58 lbs/ft <sup>3</sup>
Maximum Dry Density	55.85 lbs/ft <sup>3</sup>
Maximum Weight of Material	7,986,600 lbs.
Minimum Percent Moisture	295,504 lbs. water in waste
Maximum Weight of Dry Waste	7,691,096 lbs. dry waste
Volume of Lift Liner™	258 ft <sup>3</sup>

Using these assumptions, the amount of product produced, calculated from the RMRS treatment formulation, is:

Silo 3 Material	100% x	7,691,096 =	7,691,096 lbs. dry waste
Water	17% x	7,691,096 =	1,307,486 lbs. water
Envirobond	3% x	7,691,096 =	230,733 lbs. Envirobond™
Ferrous sulfate	2% x	7,691,096 =	<u>153,822 lbs. FeSO<sub>4</sub></u>
Amount of product produced			9,383,137 lbs. product

R1-D-204 Based on the aforementioned Silo 3 material density assumption, this formulation produces a treated density of 57.22 lbs./ft<sup>3</sup>. ~~†~~The treated waste volume is:

R1-D-208 Treated waste volume ~~7,316~~6,073 yd<sup>3</sup> product

Assuming 11,500 lbs of Silo 3 material (14,557 lbs. of treated waste) per container, below is the number of containers required:

R1-D-457 Number of containers ~~669~~645 containers

R1-D-474 Based on a lack of data, no loss in volume is assumed due to the solubility of Silo 3 material.

Many data points exist regarding the density of Silo 3 material, including loose and compacted densities. 58 lbs/ft<sup>3</sup> is assumed as a maximum density, as it represents a reasonable average of the data points. The maximum dry density calculation assumes a correction for 3.7% moisture content in the in situ material based on 1998 analytical data.

Due to the hygroscopic nature of Silo 3 material and the potential need to increase the moisture content for disposal, the quantity of waste is recalculated using ~~34~~40% moisture content.

Silo 3 material	100% x	7,691,096 =	7,691,096 lbs
Water	<del>34</del> <u>40</u> % x	7,691,096 =	<del>2,307,329</del> <u>3,076,438</u> lbs
Envirobond	<del>35</del> <u>35</u> % x	7,691,096 =	<del>230,733</del> <u>384,555</u> lbs
Ferrous Sulfate	2% x	7,691,096 =	<u>153,822</u> lbs
Amount of product produced			<del>10,382,980</del> <u>11,305,911</u> lbs

This formulation produces a treated density of 59.0 lbs/ft<sup>3</sup>. The treated waste volume is:

Treated waste volume 7,097 yd<sup>3</sup> product

Due to the volume limitations of the container, ~~9,750~~15,000 lbs of Silo 3 material per Lift Liner™ are assumed at this moisture content. This equates to ~~789~~ 742 containers.

Based on the ranges and assumptions described, a reasonable midpoint is assumed for this baseline. It is assumed that 700 Lift Liners™ of treated Silo 3 material will be produced.

Capacity Requirements – Silo 3 Operations

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The flow rates for Silo 3 Operations will be determined after design data development ~~bench-scale tests~~ are complete, verifying optimum moisture content, percent additives, and mixing time. This baseline assumes the RMRS minimally acceptable formulation, which assumes 17% moisture content, 3% Envirobond, and 2% ferrous sulfate. For purposes of estimating capacity and flow rates, 40% is assumed as the maximum moisture content, based on RMRS formulation work.

**TABLE 1-5.2  
EQUIPMENT RATES/CAPACITY**

<b>EQUIPMENT</b>	<b>RATE</b>	<b>CONVEYING CAPACITY</b>
Retrieval conveyor	Min. 30 min Max. 15 min	Max. 9094 lbs/batch or 203 cf/batch Min. 6100 lbs/batch or 137 cf/batch Max. 36,376 lbs/hr , 812 cf/hr. Min. 18188 lbs/hr, 406 cf/hr
Additives conveyor	15 minutes	Min. 460 lbs/batch or 7 cf Max. 806 lbs/batch or 12 cf Max. 3224 lbs/hr, 48 cf/hr Min. 1840 lbs/hr, 28 cf/hr
Process water		Min. 234 gal Max. 551 gal Min. 936 gal/hr Max. 2201 gal/hr
Mixer Retention time	15 minutes	Working capacity Max. 300 cf. Min. 100 cf.
Container feed conveyor	15 minutes	258 cf container size 1032 cf/hr.
Total time	1 hour	

The times above assume that containers will be cinched and a new container queued and attached to the filling chute during the time that material is being conveyed to the mixer. The inner liner of the Lift Liner™ that will seal around the filling chute will be sealed before the next container is queued to prevent spread of contamination. However, the closure straps for the container will not be secured until the Lift Liner™ has been moved and the next container in line is being filled.

### Utility Requirements

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The Silo 3 utilities are found on Grid 31A and 31B Underground Utility Detail Drawing (22A-5500-P-00961). The drawing shows the as-built information from the utility installations completed by RMRS. The utility work described below is part of the Construction scope of work and will be performed by the construction subcontractor(s).

Electrical service will originate at the existing 34.5 KVA transformer and existing 1200A, 480V, 3 $\phi$  distribution switchgear (Reference 94X-5100-E-02238) located northwest of the silos [Assumption CT5]. The project will be responsible for installing new breaker(s) and a motor control center for the treatment facility. An electrical conduit duct bank was installed under the infrastructure road from the switchgear and ends near the west fence boundary of the Silo 4. Three 3" conduits and two 2" conduits were installed. Each conduit was capped for future tie-in. Electrical 480 V service to the new Silo 3 treatment facility should be run underground continuing from this duct bank.

Area lighting for the ISA pad originates from the electrical panel at WP70. The original lighting scope for the pad was not completed due to interference of the future AWR pipe-rack with the ISA pad utility poles WP 152, WP 153, and WP 154. The utility poles were put on hold pending resolution of the routing of lighting cables. Additional work is required to install lights on the west side of the pad and power to the lights on the east side of the pad at WP 155, WP 156, and WP 157 (Reference RMRS Drawing. 54-3060).

Building lighting will require installation of a lighting panel and equipment will require installation of a step-down transformer and lighting panel.

Process water will be continued from the DW-4" HDPE tie-in point located northeast of the silo (E 20 + 10.9 and S 19 + 40.6, Elev. 573.37). Process water will be run underground to the treatment facility and then overhead as service piping within the facility. Heat-tracing will be required for freeze-protection [Assumption U5].

Fire protection service will be from the existing fire hydrant (HFH 165). This hydrant provides a reliable water supply of adequate capacity for fire suppression. The fire water branch line (FQI-8" HDPE) installed by RMRS starting at PIV 221 and ending at PIV 236 will not be continued or put into service. The treatment of the material in a tension-support system will not require a sprinkler system [Assumption SA2]; an assumption based on the existing DOE exemption to MPFL criteria as applicable to the project. The Silo 3 FHA, developed by RMRS, will be revised as the project scope develops. Lightning suppression system requirements will be evaluated.

An emergency evacuation system, including fire detection and notification systems, will be supplied from the panel in the Vitrification Pilot Plant or panel located in trailer T-414 [Assumption U7].

A breathing air system must be provided by the project. A portable 68 scfm breathing air trailer will be used [Assumption U8]. These trailers are available on-site, but due to the dedicated use for the Silo 3 facility, one will be purchased.

A storm sewer system has been installed for the Silo 3 sub-basin drainage area. No changes are expected to this system (Reference RMRS Dwg. 52-3016) [Assumption U9].

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The complete Silo 3 scope of work will be accomplished through the following tasks and subtasks. The scope and schedule for each task is described as well as the resources (labor, materials, other direct costs, and subcontracts) required to complete that task. The labor is shown in full-time equivalents. The labor identified in the resource summary tables for each task is estimated, taking into account either projectized personnel (charging full-time to the Silo 3 Project), non-projectized personnel working full time on the specific Silo 3 activity or non-projectized personnel charging time to the Silo 3 activity as work is performed. All of these labor resources are Silo 3 Project costs. Labor may also be required to support Silo 3 activities that is centralized and not included in the Silo 3 budget. If so, this is noted.

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#### 1.5.1 HS3AA - Project Management

The Project Management scope of work is defined by three project subtasks to be conducted by Fluor Fernald:

- Project management;
- Project management documentation; and
- Project closure.

##### 1) Plan/Scope - Project Management

##### 1.1) Task # 1 - Project Management

The scope of the Project Management subtask consists of those project-related activities that are needed to support the implementation of the Silo 3 Project. These tasks include department administration, management assessment, management oversight, client and stakeholder interface, routine self-assessments, audits, surveillances and inspections, development of project management documentation and interface with auditors.

Assumptions regarding assessments on the project are contained in Table 1-2.1, "Summary of Assumptions."

Implementation of the Silo 3 Project involves completion of the following project phases:

- Remedial Design;
- Construction Management;

- Subcontracts;
- Startup/Startup Review;
- Remedial Action;
- Shipping; and
- Shutdown.

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~~Prior to initiating long lead procurements during Remedial Design, a determination to proceed with the procurements will be made. This determination will conclude the timing for implementation of the remaining project phases, based on the availability of funding. The current baseline assumes that procurement and construction will proceed without delay.~~

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#### 1.2) Task # 2 - Project Management Documentation

~~Project Management Documentation consists of the preparation and approval of the PEP, and Training and Qualification Program (T&QP) by Fluor Fernald. These project management documents represent the highest level project documents generated and demonstrate the ability to execute the Silo 3 Project as required by the terms of this Closure Plan. A RAWP will also be developed by Fluor Fernald as part of the Project Management Documentation subtask and submitted to the USEPA and OEPA for review and approval. The development of high level project management documents (i.e., PEP and Training and Qualification Plan) that demonstrate the ability to execute the Silo 3 Project as required by the terms of this Closure Plan are not included in the Silo 3 baseline. These two documents will be written at a division level and developed to cover the three Silos subprojects. The scope for these activities will be included in the Silos Division Project Management account (HPM1A).~~

##### 1.2)1 Subtask #1 - Project Execution Plan

~~Following approval of the Silo 3 baseline, the existing Silo 3 Project PEP will be revised by the Silo 3 Project Manager and project team. The PEP, in accordance with Fluor Fernald procedure MS-1021, "Project Management" (Rev. 3), will describe the specific project management approaches consistent with the Fluor Fernald Management Plan. The PEP will reflect the review and incorporation of pertinent FEMP requirements and implementation documents into project planning; state the mission, organizational roles and responsibilities, scope, project execution approaches, and deliverables throughout the life of the project. The PEP will identify the ties between the execution of the remediation project and the FEMP requirements. While the PEP is intended to be compliant with applicable procedures, specific requirements detailed in the PEP will take precedence over more general requirements. Likewise, specific requirements detailed in any subsequent work plan(s) will take precedence over more general requirements in the PEP.~~

~~The PEP will be maintained throughout the duration of the Silo 3 Project. The PEP will be reviewed annually and revised as needed.~~

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#### 1.2)2 Subtask # 2 - Training and Qualification Plan

~~Following approval of the Silo 3 baseline, Fluor Fernald will revise the existing T&QP, to reflect the new plan for the Silo 3 Project and pertinent FEMP requirements. The T&QP will identify specific training and qualification requirements for Silo 3 project personnel and other administrative and support personnel within the Silos Division as documented in the Silo 3 PEP. The training and qualification requirements of project personnel described in the T&QP is intended to satisfy the requirements of Chapter I and IV of DOE Order 5480.20A. The T&QP addresses the identification and definition of the performance based training goals and how those goals will be achieved and identifies a set of training procedures, training program objectives, learning objectives, and training aids. The T&QP will include a comprehensive list of all labor classifications, and the minimum requirements and standards necessary to qualify and maintain qualification in the labor classification.~~

#### 1.2)3 1.2)1 Subtask # 13 - Remedial Action Work Plan

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The Remedial Design Work Plan [RDWP (40400-WP-0001)] established a milestone for submittal of the Remedial Action Work Plan (RAWP) to the USEPA on or before May 1, 2001. The EPA renegotiated the RAWP milestone for the Silo 3 Project. The milestone for submittal of the draft RAWP to EPA for review is October 6, 2003. Fluor Fernald will prepare for review and approval by the USEPA and OEPA a RAWP that provides the milestones for implementation of the Silo 3 remedial action and contains a brief overview description of operations. Enforceable milestones for implementation of the remedy approved in the ESD will be provided in the RAWP as well. The EPA review cycle for the RAWP will be consistent with the primary document review cycles specified in the Amended Consent Agreement.

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#### 1.3) Task # 3 - Project Closure

Although project documentation will be managed on a day-to-day basis throughout the life of the Silo 3 Project, a significant effort must be planned in order to closeout the project in accordance with FEMP Procedures. In accordance with Fluor Fernald procedure ED-12-9004, "Project Closeout" (Rev. 5), Silo 3 project management must ensure that all necessary actions have been completed to closeout the Silo 3 Project. The primary objective is to resolve all outstanding issues, document the disposition of all property, disposition all project records, and issue a Project Closure Report (PCR).

#### 1.3)1 Subtask #1 - Project Closure Report

Fluor Fernald procedure ED-12-9004, "Project Closeout" (Rev. 5), identifies the process for preparing the PCR and provides a recommended format for the report. The PCR is expected to cover the following items:

- Process or System Engineering;



- Design Engineering;
- System Build, Test, Development; and
- Additional Historical Data.

The content may vary somewhat and project reports may be referenced rather than summarized. Constructive criticism, discussion of mistakes, and lessons learned are appropriate for the report; however, a positive and objective approach must be maintained. Cost, proprietary, or sensitive information may be included in the report if it will be useful on future projects.

#### 1.3)2 Subtask #2 - Archiving Project Documentation

Fluor Fernald procedure ED-12-9004, "Project Closeout" (Rev. 5), and ED-12-5001, "Project Document Control" (Rev. 4, UDC1), identify the process for ensuring that all project documentation is properly assembled, controlled, and archived. At project completion, Silo 3 project management will review the content of the project files and assemble any documents not previously issued by ECDC. Project management will review the documents for retention of the latest revisions, proper labeling, discard of obsolete or inconsequential documents, and ensure that all documents to ECDC, including photographs and videos. ECDC will record and transmit all the project documentation to the Records Center for archiving.

#### 1.3)3 Subtask #3 - Project Closeout

Silo 3 project management must ensure that the following actions have been completed during project closeout:

- Obtain proper construction records from Construction management/oversight and Acquisitions as appropriate and verify all contractual work is completed and closed. This includes verification that all Purchase Orders and Service Contracts for the project have been closed out and final payment has been made.
- Verify all regulatory commitments and contractual requirements are completed and approved.
- Verify all documents are complete and appropriately filed. This includes requirements under RM-0033, "Management of Government Property" (Rev. 3) and ED-12-8002, "Property Turnover" (Rev. 1).
- Prepare Control Account termination forms for the Control Account Managers (CAMs) signature. This includes completion of Control Account/Charge Number Change Form per PCS-008, Work Authorization.

### Schedule

The duration of the Project Management activities are dependent upon the duration of the entire Silo 3 Project. Currently, the project management activities are logically tied to begin with the start of the project and ends with the completion of Project Closeout.

Progress against project management activities will be apportioned using progress for the balance of work in the control account.

### 2) Quantification – Project Management

#### Labor Resources

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Project personnel who provide support to the overall conduct of the project and support all activities conducted on the project, are resource loaded in the Project Management account, as well as those individuals who support the Silos Division and are shared between the three subprojects. The resources for completing the Project Management activity are summarized in Table 1-5.3. No overtime is planned for this activity.

**TABLE 1-5.3  
 PROJECT MANAGEMENT RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
CLERK*	0.3	Silos Document Control Lead (shared resource)
CNSMGR***	0.2	Silos Project Construction Manager (shared resource)
DEPADM***	0.2 1.0	Administration of management programs for Silos Construction (shared resource)
ENGINR***	0.3	Silos Engineering Documentation Lead (shared resource)
MNTMGR*	0.3	Silos Maintenance Lead (shared resource)
PRJMGR**	1.6 1.0	Silo 3 Project Manager, Silos Operations & Maintenance Manager (0.3 FTE), Silos Engineering Manager (0.3 FTE) (shared resources)
QACMGR*	0.3	Silos QA/QC Manager (shared resource)
S&HMGR*	0.3	Silos Safety and Health Manager (shared resource)
SECRET**	1.3	Administration of management programs for Silo 3 (1.0 FTE), administration of management programs for Silos Operations (shared between projects)
TPSMGR*	0.2	Silos Project Assessments and Readiness Manager (shared resource)
TPSREP**	1.6 1.0	General technical support for preparing management documentation, coordinating assessments, etc., H&S input

\* These resources begin charging to this account the 3<sup>rd</sup> quarter of FY2001.

\*\* One FTE of these resources begins charging to this account in the 1<sup>st</sup> quarter FY2001, the remaining FTEs for these resources begin charging the 3<sup>rd</sup> quarter of FY2001.

\*\*\* These resources begin charging to this account the 2<sup>nd</sup> quarter of FY2002.

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By direction from the Closure Planning Committee, the Manpower Planning Sheets (MPS) for the Project Management account also include construction subcontractor craft and staff. A description of these numbers can be found in Section 1.5.4, under the Subcontract account. Including these subcontractor personnel in the manpower planning allows the site to estimate the number of construction subcontractor personnel performing work on-site at any given period.

Materials, ODCs, and Subcontracts

The materials, other direct costs (ODCs), and subcontracts for Project Management are identified in Table 1-5.4:

**TABLE 1-5.4  
MATERIALS, ODCs, AND SUBCONTRACTS – PROJECT MANAGEMENT**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	None	---

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1.5.2 HS3AB Remedial Design

TO BE REPLACED IN ENTIRETY WITH DESIGN TEXT  
THAT FOLLOWS THIS SECTION >

~~Remedial Design consists of activities necessary to design the facilities to remediate Silo 3 and process fissile compounds. Configuration management activities during Title III engineering are also included in this scope. The remedial design includes the following key tasks:~~

- ~~• Bench scale testing;~~
- ~~• Conceptual Design development;~~
- ~~• EDP development (preliminary and final);~~
- ~~• RD Package development;~~
- ~~• PHAR development;~~
- ~~• HASP/PSHSRM development; and~~
- ~~• Title III engineering support.~~

1) Task # 1 Bench Scale Testing

1.1) Plan/Scope Bench Scale Testing

~~Archived Silo 3 material is located at the FEMP. It is assumed that there is a sufficient amount of archived material to provide meaningful data to support the development of design. Bench scale testing will be conducted to collect data and verify the effectiveness of the proposed treatment formulation for Silo 3 chemical stabilization, to determine~~

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~~optimum moisture of the Silo 3 material, and to support the development of the design of the Silo 3 treatment process and support facilities. This testing involves the following three key subtasks:~~

- ~~• Bench Scale Test Work Plan~~
- ~~• Bench Scale Tests~~
- ~~• Bench Scale Test Report~~

#### ~~1.1)1 Subtask #1 Bench Scale Test Work Plan~~

~~The Fluor Fernald Silos Engineering Team will prepare the Bench Scale Test Work Plan with the support of the DFS Technical Support Team. In accordance with MS 1027, "Laboratory Building Work Planning and Management", (Rev. 1), a work plan and pertinent supporting documentation (i.e., permits, procedures, etc.) will be prepared, reviewed and approved by appropriate personnel, prior to initiating any laboratory activities. The documentation is a comprehensive package which identifies the scope of work, defines responsibilities of project personnel, identifies prerequisites to performing specific activities, identifies health and safety hazards and mitigators, defines procedures to be followed, disposition of all waste generated, drivers, checklists, appropriate permits and sign-offs.~~

#### ~~1.1)2 Subtask #2 Bench Scale Tests~~

~~The bench scale tests will be conducted at the FEMP on a laboratory scale using archived Silo 3 material. With the support of Jesse Connor, an internationally known independent consultant, a Fluor Fernald team will refine the stabilization formulation, using data already generated by RMRS in prior treatability efforts. Jesse Connor's support will be obtained through modification of the existing Silos 1 & 2 contract for his services. RMRS will also provide technical support for testing, and Envirobond™ to conduct the tests, per the settlement agreement. A license agreement with RMRS must be executed prior to receiving Envirobond™ for testing. The bench scale tests will be conducted with the following objectives:~~

- ~~• Establish optimum moisture of Silo 3 material;~~
- ~~• Verify desired treatment formulation meets the Envirocare waste acceptance criteria;~~
- ~~• Establish treated waste product's physical, chemical and radiological characteristics;~~  
~~and~~
- ~~• Identify process control parameters and establish an operating envelope.~~

~~It is assumed that laboratory samples and laboratory wastes will be properly disposed by the FEMP laboratory directly and would not be returned to the Silo 3 Project.~~

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### 1.1)3 Subtask #3 Bench Scale Test Report

A Bench Scale Test Report will be developed by Fluor Fernald, reviewed by selected project personnel and finalized. The Bench Scale Test Report will present and summarize the data generated during the bench scale testing. The final report will contain the following information (as a minimum):

- Present results of methods used to obtain optimum moisture of Silo 3 material;
- Describe and tabulate treatment formulations tested;
- Present tests and results of desired formulation; and
- Present the desired formulation operating recipe based on the test results.

Completion of the bench scale testing and subsequent Bench Scale Test Report are key predecessor activities to completing container approval and beginning procurement of key equipment.

#### Schedule

Table 1-5.5 summarizes the sub-activities and their durations (workdays) for the development of the Bench Scale Testing. It is assumed that bench scale testing cannot begin until the Bench Scale Work Plan is approved.

**TABLE 1-5.5  
BENCH SCALE TESTING SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HS3B0300	Bench Scale Testing Program (Hammock)	143	—
HS3B0315	Prepare Draft Bench Scale Testing Work Plan	24	15%
HS3B0320	Review Draft and Comment	9	20%
HS3B0325	Incorporate Comments and Finalize	9	25%
HS3B0330	Approve/Accept Work Plan	9	30%
HS3B0345	Procure Chemicals	9	35%
HS3B0360	Conduct Testing	27	70%
HS3B0415	Prepare Draft Bench Scale Test Report	24	85%
HS3B0420	Review Draft Bench Scale Test Report	14	90%
HS3B0425	Incorporate Comments and Finalize	14	95%
HS3B0430	Approve/Accept Bench Scale Test Report	4	100%

All activities are assumed to have a "finish to start" relationship. The project schedule and planned resources also assume that Fluor Fernald will provide a copy of the Bench Scale Test Work Plan to DOE for information only. Progress on the key activities will be tracked

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and reported based upon the designated milestones identified with the completion of the respective activity.

#### 1.2) Quantification — Bench Scale Testing

##### Labor Resources

The resources for completing Bench Scale Testing are summarized in Table 1-5.6. With the exception of the TPSREP, none of these resources are projectized. No overtime is planned for this activity.

**TABLE 1-5.6  
BENCH SCALE TESTING RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
TPSREP	0.8	Support Test Plan development
PRJMGR	0.3	DFS Guide Test Plan development
WSTENG	0.8	Support Test Plan development
ENGPRG	0.6	Chemical Engineer, Process Engineer — Support Test Plan development
LABCHM	0.8	Lab Tech — Perform bench scale testing
WSTMGR	0.2	WAC input to Test Plan
BUYCON	0.2	Procure chemicals
RADENG	0.5	Develop work permits and radiological controls
INDHYG	0.1	Develop work permits and IH controls
RADTEC	0.1	Implement radiological controls
MVOOPR	0.1	Move drums of Silo 3 material to lab
LABMGR	0.1	Approve Test Plan

##### Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Bench Scale Testing are identified in Table 1-5.7:

**TABLE 1-5.7  
MATERIALS, ODCS, AND SUBCONTRACTS — BENCH SCALE TESTS**

ITEM	DESCRIPTION/BASIS	COST
Materials	Treatment chemicals	\$5,000
	Equipment Rental (i.e., table top mixers)	\$10,000
	Consumables	\$5,000
ODCs	None	—
Subcontracts	Independent Consultant — Jesse Conner	\$50,000

Any lab work or analytical data necessary to determine the blending formulation of soil to fissile compounds will be conducted by NMD and managed under PBS-08.

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~~2) Task # 2 Conceptual Design~~

~~2.1) Plan/Scope Conceptual Design~~

~~Design requirements to initiate the engineering design process (ED 12-4001, "Functional Requirements Document," Rev. 3) and a conceptual design will be developed by a small team at the FEMP, including Fluor Fernald, DFS and Jacobs personnel. At the beginning of conceptual design, the Silos team will collaborate with Waste Generators Services (WGS) and other FEMP projects to identify other FEMP remediation needs that can be addressed using the Silo 3 equipment. However, equipment and design for other FEMP project functions, excluding NMD, are not included in the Silo 3 baseline. Fluor Fernald will also work with the IT Group to integrate rail operations at the WPRAP facility and capitalize on the design work and procedures already in place at WPRAP. Collaboration with IT will be pursued through a contract modification to IT's WPRAP contract.~~

~~The functional criteria and requirements will address design concepts such as minimum performance capabilities/margins, design basis criteria, diversity, reliability, availability, independence, redundancy, separation, environmental protection, and health and safety protection, as applicable. The criteria will incorporate organizational requirements, DOE directives, regulatory requirements, historical information, and engineering experience to ensure that the final project meets the requirements of the intended function.~~

~~A preliminary structural evaluation has been conducted prior to the baseline to verify that the structural integrity of Silo 3 would not be compromised by cutting an opening in the silo. A more detailed evaluation will be conducted, by a specialty subcontractor, during conceptual and preliminary engineering to determine whether reinforcement of the opening may be required. Mechanical excavation would not require that any loads be placed on the silo dome. Fluor Fernald Silos Engineering, which includes DFS and Jacobs, with consult from a post-tensioning tank specialist, will perform structural calculations and develop and approve the plans for cutting an opening at the bottom of the silo wall, and develop appropriate plans for this process. These calculations will determine if reinforcing of the silo is required. Fluor Fernald will also capitalize on the expertise of its university subcontractors, such as Florida International University (FIU) and the University of Cincinnati (UC), to provide review of the requirements and plans for cutting the opening in Silo 3. It is assumed that reinforcement of the opening will be required and that \$100,000 of structural steel or bands will be required. The quantity of reinforcing will be determined during design, and is not known at the time of baseline preparation. It is assumed that a 15' h x 15' w opening can be cut.~~

~~Schedule~~

~~The schedule for completing the conceptual design is summarized by the following activities in Table 1-5.8:~~

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**TABLE 1-5.8**  
**CONCEPTUAL DESIGN SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HS3B0610	Conceptual Design (Hammock)	36	—
HS3B0614	Prepare Conceptual Design	18	50%
HS3B0618	Review Draft Conceptual Design	9	75%
HS3B0622	Incorporate Comments and Finalize	9	100%

2.2) Quantification — Conceptual Design

Labor Resources

The resources for completing the Conceptual Design are summarized in Table 1-5.9. Design resources, except the project engineer, are shared resources with other Silos projects, and are not projectized to the Silo 3 Project. No overtime is planned for this activity.

**TABLE 1-5.9**  
**CONCEPTUAL DESIGN RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
CNSMGR	1.0	Project Engineer — Structural Analysis
TPSREP	1.0	Input to design
TPSMGR	0.5	S&H input to design
OPRMGR	0.3	Operability input to design
PRJMGR	0.2	DFS — manage design development
CNSENG	0.1	Constructability input to design
QACENG	0.5	Quality input to design
RADENG	0.5	Radiological controls development
INDHYG	0.3	S&H development
ENGCVL	0.5	Design development, structural analysis oversight
ENGMEC	0.5	Design development
ENGELE	1.0	Design development
WSTMGR	0.2	WAC input to design, container approval
ENGINR	0.5	System Engineer — Design development
FPRENG	0.2	Fire protection input to design
PJCEST	0.5	Prepare project estimate for baseline

Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Conceptual Design are identified in Table 1-5.10.



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**TABLE 1-5.10**  
**~~MATERIALS, ODCS, AND SUBCONTRACTS~~ ~~CONCEPTUAL DESIGN~~**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	—
ODCs	Travel (to Jacobs Oak Ridge)	\$10,000
Subcontracts	Specialty Subcontractor (design and analysis for cutting silo)	\$100,000
	IT Group (design support)	\$40,000

~~3) Task #3 Engineering Design Package (Preliminary)~~

~~3.1) Plan/Scope Engineering Design Package (Preliminary)~~

~~Upon completion of conceptual design and functional requirements, Fluor Fernald will prepare an Engineering Design Package (EDP), which provides the design and specifications necessary to construct and operate equipment for Silo 3 remedial action and fissile compounds operations. The EDP provides the engineering basis required to support the Silo 3 Statement of Work (SOW). The development of the EDP will include design review sessions to present design details for the Silo 3 effort to support/interfacing Functional Areas and organizational personnel (as required in ED-12-4002, "Conceptual Design Report", Rev. 2). Specific criteria (ED-12-4003, "Design Criteria Package", Rev. 3) required to support the Silo 3 design would be included in this package as well. These criteria will be presented in a logical format, where the fundamental criteria and assumptions are identified at an appropriate level of detail (e.g., by system). The functional requirements and design criteria will be used to create a WAC for receipt of fissile compounds in the Silo 3 facility.~~

~~The EDP will satisfy requirements noted in the Site Procedures NS-0002, "Unreviewed Safety Question Determination and Safety Evaluation System" (Rev. 6) and NS-0003, "Obtaining Safety Analysis Report" (Rev. 5). Finally, the EDP is maintained by Engineering to facilitate the design, construction services, operational planning, as low as reasonably achievable (ALARA), safety and health, property management, and all closeout issues (ED-12-4004, "Design Package", Rev. 5).~~

~~During this scope of work, the design constructability review process will also be performed. The design constructability review process involves evaluating and integrating practical construction practices and requirements into the design configuration by ensuring safety; efficiency; cost and schedule benefits; productivity in field construction operations; safe accessibility of personnel, material, and equipment; facilitation of construction during adverse weather; sequencing activities to facilitate system turnover and start up; and the use of innovative construction methods to enhance constructability. Constructability reviews also include waste planning, and decontamination and demolition planning.~~

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The EDP will be prepared in two steps—preliminary and final. The preliminary package will be prepared in conjunction with revision of the PHAR. The Preliminary EDP will demonstrate the appropriate integration of requirements and criteria into the design, and once approved, will establish the technical baseline for configuration management. Activities that will be conducted under the Preliminary EDP include:

- Container selection
- Performance grading
- Process description
- Retrieval description
- Process Flow Diagram/Mass Balance
- Piping and Instrumentation Diagrams (P&ID)
- Layout/Arrangement Drawing
- Equipment List

The structural evaluation begun during Conceptual Design will continue throughout the development of the Preliminary EDP.

#### Schedule

The schedule for completing the Preliminary Engineering Design Package is summarized by the following activities in Table 1-5.11:

**TABLE 1-5.11**  
**ENGINEERING DESIGN PACKAGE (PRELIMINARY) SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HS3B0810	Engineering Design Package (Prelim) (Hammock)	60	--
HS3B0814	Start Engineering Design Package	--	20%
HS3B0916	Complete Structural Evaluation	28	20%
HS3B0814	Prepare Draft Engineering Design Package	40	20%
HS3B0818	Fluor Fernald/DOE Review and Comment	9	15%
HS3B0822	Incorporate Comments and Revise to Final Engineering Design Package	9	15%
HS3B0826	Fluor Fernald, Inc. Approves Engineering Design Package (prelim)	2	10%
		<b>TOTAL</b>	<b>100%</b>

Progress on the key activities will be tracked and reported based upon the designated milestones identified with the completion of the respective activity. Percentages indicated

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will be taken upon completion of that activity, accumulating to a total of 100%, upon completion.

### 3.2) Quantification — Engineering Design Package (Preliminary)

#### Labor Resources

The resources for completing the Preliminary Engineering Design Package are summarized in Table 1-5.12. No overtime is planned for this activity.

**TABLE 1-5.12  
ENGINEERING DESIGN PACKAGE (PRELIMINARY) RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
CNSMGR	0.8	Project Engineer (projectized) — design development
TPSREP	0.3	Technical support for design development
TPSMGR	0.4	Safety management input to design
OPRMGR	0.4	Operability input to design (shared resource)
PRJMGR	0.2	DFS — Design manager (shared resource with Silos 1 & 2)
CNSENG	0.3	Constructability review (not projectized)
QACENG	1.0	QA lead (projectized)
RADENG	0.3	Radiological control development (not projectized)
INDHYG	0.2	S&H input into design (not projectized)
ENGCVL	0.5	Structural analysis oversight (shared resource with AWR)
WSTMGR	0.5	WAC compliance input, container approval
ENGINR	0.5	System engineer — input to design (not projectized)
BUYCON	1.0	Contract administrator/buyer (projectized)
FPRENG	0.2	Fire protection input (not projectized)
PJGEST	0.5	Develop project cost estimate
WSTENG	1.5	Engineering input, container review and approval
ENSREP	0.2	Rail operations input
TPHO	13.0	Mechanical Engineers (3.0), Electrical Engineers (2.0), System Engineers (2.0), Civil Engineers (2.0), Process Engineers (2.0), Engineering Manager (1.0), CADD Operator (1.0)

#### Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Preliminary Engineering Design Package are identified in Table 1-5.13.

**TABLE 1-5.13  
MATERIALS, ODCS, AND SUBCONTRACTS — ENGINEERING DESIGN PACKAGE  
(PRELIMINARY)**

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ITEM	DESCRIPTION/BASIS	COST
Materials	None	—
ODCs	Travel (to Jacobs Oak Ridge or vendor shops)	\$30,000
Subcontracts	University (review of cutting silo)	\$30,000

#### ~~4) Task #4 Engineering Design Package (Final)~~

##### ~~4.1) Plan/Scope Engineering Design Package (Final)~~

The Final EDP will follow completion of the preliminary package, with the purpose of completing detailed design work, and producing specifications for procurement and drawings that will be certified for construction (CFC). The Fluor Fernald Silos team will utilize engineering resources, including those of Jacobs (Oak Ridge), to perform detailed design. These resources will complement the staff allocated to perform design for Silos 1 & 2. Fluor Engineering will assist Jacobs throughout the development and preparation of the Final EDP and will participate in "over the shoulder" reviews to expedite the preparation of the required documentation. Fluor Fernald Safety Analysis team members will closely interface with Jacobs throughout the development of the final design to ensure consistency, continuity, and completeness with the safety basis documentation. All the appropriate parties (i.e., engineering, construction, operations, etc.) will be involved in the review of the design package, so that the verification of the Final EDP will satisfy the requirements of the Fluor Fernald Procedure ED 12 4010, "Design Verification," (Rev. 7). The final design will complete the efforts of the preliminary design, and include the following additional activities:

- ~~Equipment Specifications (including mixing equipment, conveying equipment, pneumatic system) and interfaces with vendors for equipment information required to complete the design. Major equipment estimated for the Silo 3 Project is described in Sections 1.5.3 and 1.5.4.~~
- ~~Piping Arrangements/ISOs~~
- ~~Utility drawings (drinking water, stormwater, electric, breathing air)~~

#### Schedule

The schedule for completing the Final Engineering Design Package is summarized by the following activities in Table 1-5.14:

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**TABLE 1-5.14**  
**ENGINEERING DESIGN PACKAGE (FINAL) SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HS3B2410	Engineering Design Package (Final) (Hammock)	64	—
HS3B2420	Start Final Engineering Design Package	40	30%
	Prepare Draft Engineering Design Package (Final)		60%
HS3B2530	Fluor Fernald/DOE Review and Comment	9	75%
HS3B2640	Incorporate Comments and Revise to Final Engineering Design Package	11	90%
HS3B2650	Fluor Fernald, Inc. Approves Engineering Design Package (Final)	4	100%

All activities are assumed to have a "finish to start" relationship. Progress on the key activities will be tracked and reported based upon the designated milestones identified with the completion of the respective activity.

In parallel to development of the EDP, modifications to the CSX rail contract will be pursued. A contract modification will be obtained with CSX by DOE to allow shipment of the LSA-II Silo 3 material under the existing CSX contract.

#### 4.2) Quantification Engineering Design Package (Final)

##### Labor Resources

The resources for completing the Final Engineering Design Package are summarized in Table 1-5.15. No overtime is planned for this activity.

**TABLE 1-5.15**  
**ENGINEERING DESIGN PACKAGE (FINAL) RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
CNSMGR	0.8	Project Engineer (projectized) — design development
TPSREP	1.4	Technical support (one projectized, others shared)
TPSMGR	0.2	Safety management input (not projectized)
OPRMGR	0.4	Operability reviews (not projectized)
PRJMGR	0.2	DFS — Engineering manager
CNSENG	0.2	Constructability reviews (not projectized)
QACENG	0.2	QA lead (projectized) — balance of resource captured in Construction IFB activity
RADENG	0.3	Radiological control input (not projectized)
ENGCVL	0.5	Structural analysis oversight (resource shared with AWR)

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RESOURCE CODE	FTEs	COMMENTS
WSTMGR	0.2	WAC compliance input
BUYCON	1.0	Contract Administrator (projectized) — Issuing POs and specs to vendors
FPRENG	0.2	Fire protection input (not projectized)
WSTENG	1.6	Engineering input, container input
ENSREP	0.2	Rail operations input
TPHO	14.0	Mechanical Engineers (4.0), Electrical Engineers (2.0), System Engineers (1.0), Civil Engineers (2.0), Process Engineers (3.0), Engineering Manager (1.0), CADD (1.0)

Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Final Engineering Design Package are identified in Table 1-5.16. No overtime is assumed for this activity.

**TABLE 1-5.16**  
**MATERIALS, ODCS, AND SUBCONTRACTS — ENGINEERING DESIGN PACKAGE (FINAL)**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	—
ODCs	Travel (to Jacobs Oak Ridge, vendor shops for inspections during issuance of purchase orders)	\$40,000
Subcontracts	None	—

5) Task #5 Remedial Design Package

5.1) Plan/Scope Remedial Design Package

Fluor Fernald will develop and compile the principal elements of the Engineering Design Package relating to Silo 3 remediation into a single RD Package for USEPA and OEPA review. The RD Package submitted will be a revision to the RD Package prepared by RMRS and approved by USEPA in September 2000. The RD Package will not address processing of fissile compounds. The RD Package will provide the EPAs with "an understanding of the (Silo 3) design, retrieval, operation and controls necessary to ensure protection of the workers, public, health, safety and the environment." The following principal elements will be included in the RD Package:

- Process Description
- Retrieval Description
- Process Control Plan
- Sampling and Analysis Plan
- Operational Environmental Control Plan

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- ~~Transportation and Disposal Plan~~
  - ~~Silo 3 Gross Decontamination Plan~~
  - ~~ARARs Compliance Strategy~~
  - ~~Contingency Plan~~
  - ~~Health and Safety Controls~~

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- ~~Environmental Monitoring Plan~~
  - ~~Process Flow Diagrams~~
  - ~~General Arrangement Drawings~~
  - ~~Heat and Material Balance~~

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5.1)1 Subtask #1 Process Description

The Process Description will provide an overview description of the process to retrieve, convey, treat and package the Silo 3 material. This document will serve as a guide to the more detailed information presented in the remainder of the RD Package.

5.1)2 Subtask #2 Retrieval Technology Description

The Retrieval Technology Description will describe the material retrieval performance specification and the retrieval process, as well as documents the contamination control philosophy for entering Silo 3.

5.1)3 Subtask #3 Process Control Plan

The Process Control Plan will describe the control system for the Silo 3 treatment process. The Silo 3 Project will retrieve and treat the Silo 3 material in accordance with the Envirocare WAG. Fluor Fernald will revise the RMRS Process Control Plan to reflect the new approach.

5.1)4 Subtask #4 Sampling and Analysis Plan

The Sampling and Analysis Plan (SAP) will describe sampling and analysis for WAG attainment for the treated Silo 3 material. The existing Silo 3 SAP will be revised by Fluor Fernald, to reflect the new sampling approach.

5.1)5 Subtask #5 Operational Environmental Control Plan

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The Operational Environmental Control Plan will describe the methods and materials to be used during the remedial action to control air emissions, fugitive dust, wastewater, stormwater, erosion and waste. The RMRS Operational Environmental Control Plan will be revised by Fluor Fernald to reflect the new approach.

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~~5.1)6 Subtask #6 Transportation and Disposal Plan~~

~~The Transportation and Disposal Plan will provide a detailed description of transportation and disposal operations to ensure safe and successful transportation of treated Silo 3 material to Envirocare. The existing Silo 3 Transportation and Disposal Plan will be revised by Fluor Fernald, to reflect the new transportation and disposal approach.~~

~~5.1)7 Subtask # 7 Silo 3 Gross Decontamination Plan~~

~~The Gross Decontamination Plan will describe the proposed methods to remove the "visible Silo 3 material" remaining and apply a fixative to the interior of Silo 3, leaving the silo in a safe configuration for final dismantlement. The definition of "visible Silo 3 material" is material that is obvious to the naked eye, and that, if rubbed or rinsed, would be easily removed. The RMRS Silo 3 Gross Decontamination Plan will be revised by Fluor Fernald, to reflect the approach for silo decontamination.~~

~~5.1)8 Subtask #8 ARARs Compliance Strategy~~

~~ARARs and TBC requirements were identified in the December 7, 1994, ROD for remedial actions at the OU4. The ARARs Compliance Strategy will identify each ARAR and TBC requirement and the strategy used by the Silo 3 Project to meet the requirement. Fluor Fernald will revise the RMRS ARARs Compliance Matrix to reflect the new approach.~~

~~5.1)9 Subtask #9 Contingency Plan~~

~~The Contingency Plan for the remedial action will provide the instructions for response to emergencies and unusual events for Silo 3 Project personnel. This Contingency Plan, in conjunction with the FEMP Emergency Plan will detail the necessary plans and procedures to adequately address emergency situations. The RMRS Contingency Plan will be revised by Fluor Fernald, to reflect any new emergency situations introduced by the new approach.~~

~~5.1)10 Subtask #10 Health and Safety Controls~~

~~The Health and Safety Controls (H&SC) section will describe the overall process for the development of safety documentation to support the remedial action phase of the Silo 3 Project. The H&SC is an upper tier document that will identify specific Silo 3 documents that detail the preventative measures, safety controls, and actions to be taken to mitigate the consequences of occupational, public, and environmental hazards associated with the operations phase of the Silo 3 Project. Fluor Fernald will revise the RMRS H&SC document to reflect the health and safety controls required by the new approach.~~



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#### 5.1)11 Subtask #11 — Environmental Monitoring Plan

Site-wide environmental monitoring is addressed in the Integrated Monitoring Plan (IEMP), while project-specific requirements are addressed within the environmental control plans, process control plans, and other design documents that constitute the project's RD Package. For the Silo 3 Project and the Silos 1 and 2 Accelerated Waste Retrieval (AWR) Project, modifications to the site-wide environmental program are necessary to support project activities. Therefore, the focus of this plan is to establish the integrated environmental monitoring requirements for OU4 during the conduct of both projects.

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#### 5.1)12 Subtask #12 — Process Flow Diagrams

The Process Flow Diagrams (PFDs) will provide a schematic explaining how the process flows from the material feed to the end product. This schematic will identify equipment, piping and instrumentation required by the process. The PFDs will be an excerpt from the Conceptual Design Package.

#### 5.1)13 Subtask #13 — General Arrangement Drawings

The General Arrangement (GA) drawings will provide a graphical depiction/portrayal of the footprint/outline of SSCs for the project. The GA drawings will be an excerpt from the Conceptual Design Package.

#### 5.1)14 Subtask #14 — Heat and Material Balance

The Heat and Material Balance will show the mass flow and balance for each material stream anticipated, along with the assumptions supporting the calculations. The Heat and Material Balance will be an excerpt from the Conceptual Design Package.

#### Schedule

The schedule for completing the Remedial Design Package is summarized by the following activities in Table 1-5.17:

**TABLE 1-5.17  
REMEDIAL DESIGN PACKAGE SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HS3B2910	Remedial Design Package (Hammock)	156	—
HS3B2920	Update Remedial Design Package	40	40%
HS3B2930	Fluor Fernald/DOE Review Draft and Comment	9	50%
HS3B2940	Incorporate Comments and revise	9	60%

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HS3B2970	EPAs Review Draft RD Package	60 (calendar days)	70%
HS3B2980	Address EPA Comments and Submit Draft Final RD Package	18	80%
HS3B3000	EPAs Review and Approve Draft Final	30 (calendar days)	90%
HS3B3020	Finalize and Approve Remedial Design Package	17	100%

Progress on the key activities will be tracked and reported based upon the designated milestones identified with the completion of the respective activity.

#### 5.2) Quantification - Remedial Design Package

##### Labor Resources

The resources for completing the Remedial Design Package are summarized in Table 1-5.18. No overtime is planned for this activity.

**TABLE 1-5.18  
REMEDIAL DESIGN RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
CNSMGR	0.2	Project engineer (projectized)
TPSREP	1.1	Writing RD package (one resource projectized)
TPSMGR	0.2	Safety management input (not projectized)
OPRMGR	0.3	Operations input
RADENG	0.2	Radiological controls input
ENGPRC	0.1	System engineering input
WSTMGR	0.5	Development of Transportation and Disposal Plan
ENSREP	0.6	WPRAP, Sampling - development of Sampling and Analysis Plan

##### Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Remedial Design Package are identified in Table 1-5.19.

**TABLE 1-5.19  
MATERIALS, ODCS, AND SUBCONTRACTS - REMEDIAL DESIGN PACKAGE**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	—
ODCs	None	—
Subcontracts	None	—

#### 6) Task # 6 - Preliminary Hazard Analysis Report

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#### ~~6.1) Plan/Scope Preliminary Hazard Analysis Report~~

~~The project Safety Basis is defined as the combination of information relating to the control of hazards at a nuclear facility (including design, engineering analysis, and administrative controls), upon which the DOE bases its conclusion that the activities at the facility can be conducted safely. Each project or activity is categorized by its hazards severity following the criteria set forth in DOE-EM-STD-5502-94. The hazard categorization of Silo 3 dictates the documentation required for assessing the hazards associated with the planned activities and establishing the Authorization Basis for performing the activities. The safety basis documentation will progress in parallel to design, with the results of the evaluations and analyses being considered and integrated into the ongoing engineering and design effort. Likewise, as the engineering and design effort evolves, new information and design details will be evaluated by the appropriate safety analysis.~~

~~The safety basis for the Silo 3 Project will consist of the following key safety documents:~~

- ~~• Preliminary Hazard Analysis Report (PHAR)~~
- ~~• Final Hazard Analysis Report (FHAR)~~

~~For purposes of the Remedial Design phase of this project, only the PHAR will be prepared. The FHAR will be discussed in Section 1.5.5 (Task #3), under the Startup/Startup Review portion of the Silo 3 Closure Plan.~~

~~In parallel to the ongoing development of the EDP, Fluor Fernald Safety Analysis team members will revise the existing Silo 3 safety basis documents developed by RMRS, including the PHAR, HCCs, Accident Analysis, Integrated Hazard Analysis (IHA), Fire Hazard Analysis (FHA), and Human Factors Evaluation (HFE), to reflect the new approach consistent with DOE-STD-3009-94, Chapters 1-5. A PHAR is required for DOE authorization to procure, construct and test a new HC3 facility. The PHAR will be developed to identify safety design criteria, analyze potential hazards, propose measures to eliminate, control, or mitigate these hazards, and analyze potential risks. The PHAR will be supported by the following structured evaluations and analyses using engineering design information from the evolving Preliminary EDP:~~

- ~~• HCCs~~
- ~~• Accident Analysis~~
- ~~• ALARA Analysis~~
- ~~• IHA~~
- ~~• FHA~~
- ~~• Human Factors Evaluation (HFE)~~

~~Currently Silo 3 is classified as a HC3 non-reactor nuclear facility based on the inventory of radioactive material and on the accident analysis for a silo dome failure. From a Nuclear~~

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and Systems Safety standpoint, the Silo 3 retrieval activity must be evaluated to determine whether the activity will put a greater amount of material at risk than previously evaluated and if so, whether the amount will exceed the HC2 thresholds. In addition, Fluor Fernald, must evaluate whether the approach will increase the probability of the bounding accident — Silo dome failure.

A Technical Safety Requirement (TSR) for the OU4 Silos was developed to provide controls to reduce the probability of the bounding accident occurring. Therefore, a structural evaluation (performed during conceptual and preliminary design) will be required to verify that cutting an opening in Silo 3 would not increase the probability of dome failure. However, based on a preliminary analysis of this retrieval approach, controls, such as containment, would be required to mitigate a potential release of exposed material, but the hazard categorization of the facility would not change.

The PHAR will not address processing of fissile compounds. Separate safety documentation will be prepared for this work by PBS-08. It is assumed that Fissile Compounds Operations will be a radiological hazard activity.

#### Schedule

The preparation of the PHAR and its supporting documentation will continue seamlessly following the preparation of the Preliminary EDP. Any changes in the document would be incorporated as appropriate into the PHAR. The schedule for the PHAR and its supporting documentation is summarized by activity in Table 1-5.20.

**TABLE 1-5.20**  
**PRELIMINARY HAZARD ANALYSIS REPORT SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
Safety Basis Support Documentation			
HS3B3700	Preliminary HCCs		—
HS3B3710	Preliminary Accident Analysis		—
HS3B3720	Preliminary ALARA Analysis		—
HS3B3730	Preliminary IHA		—
HS3B3740	Preliminary FHA		—
HS3B3750	Preliminary HFE		—
Safety Basis Document			
HS3B3510	Preliminary Hazard Analysis Report (Hammock)	140	—
HS3B3520	Initiate Preparation of Draft PHAR	27	10%
	Complete Preparation Draft PHAR		40%
HS3B3530	Fluor Fernald Review/Revise Draft PHAR	14	45%
HS3B3540	DOE Review Draft PHAR	14	50%
HS3B3550	Incorporate Comments and Revise PHAR	9	60%

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ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HS3B3560	ISRC Review PHAR	9	65%
HS3B3570	Incorporate Comments and Revise PHAR	9	70%
HS3B3590	Fluor ISRC Accepts PHAR	9	75%
HS3B3600	DOE Review PHAR	25	80%
HS3B3620	Incorporate Comments and Revise PHAR	18	90%
HS3B3630	DOE Approves PHAR	10	—
HS3B3640	DOE Issues PHAR SER	0	100%

Incremental progress on the support documentation components will be difficult to quantify based upon the evolution of the engineering and design effort. This documentation is prepared in parallel and can affect each other significantly. Therefore, for reporting purposes progress on the key activities will be tracked and reported based upon the designated milestones identified with the completion of the respective activity.

#### 6.2) Quantification Preliminary Hazard Analysis Report

##### Labor Resources

The resources for completing the PHAR are summarized in Table 1-5.21. No overtime is planned for this activity.

**TABLE 1-5.21  
PRELIMINARY HAZARD ANALYSIS REPORT RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
TPSMGR	0.3	Safety management input (not projectized)
TPSREP	1.0	Technical support
OPRMGR	0.1	Operations input for IHA and ALARA Analysis development (not projectized)
RADENG	0.7	Input for IHA and ALARA Analysis development (not projectized)
HAZWAT	0.1	IHA input
INDHYG	0.1	IHA input
FPRENG	0.1	FHA input

In addition to these labor resources, which have been included in the Silo 3 baseline, there are several centralized resources, which are needed to support the development and review of the PHAR, but are not included in this baseline. These include: safety analysis personnel and management, human factors engineering, and ALARA committee management.

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Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for the Preliminary Hazard Analysis Report are identified in Table 1-5.22.

**TABLE 1-5.22**  
**MATERIALS, ODCS, AND SUBCONTRACTS — PRELIMINARY HAZARD ANALYSIS REPORT**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	—
ODCs	None	—
Subcontracts	None	—

7) Task #7 Health and Safety Plan/Health and Safety Requirements Matrix

7.1) Plan/Scope Health and Safety Plan/Health and Safety Requirements Matrix

In addition to the safety basis documentation, a Health and Safety Plan (HASP) and Project Specific Health and Safety Requirements Matrix (PSHSRM) will be developed by Fluor Fernald to cover the construction, fissile compounds operations, remedial action, and facility shutdown phases of the project. The HASP will identify the health and safety requirements for the Silo 3 Project and will be accompanied by the PSHSRM, which outlines the minimum medical, radiological, industrial hygiene, safety and training requirements to perform the planned activities. The PSHSRM includes a hazard analysis for each task and required mitigators; including personal protective equipment, engineering and administrative controls, pre-job planning and permits, personnel and air monitoring, medical monitoring and medical surveillance, and decontamination and disposal procedures.

The HASP will also identify the radiological hazards of the Silo 3 Project and controls (e.g., engineering and administrative controls, personal protective equipment (PPE), etc.) to mitigate those hazards, as well as the project's ALARA goals. A separate Health Physics Plan (HPP) will not be prepared.

Schedule

The schedule for the Health and Safety Plan is summarized by the activities in Table 1-5.23. This schedule assumes that a copy will be provided to DOE for information.

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**TABLE 1-5.23**  
**HEALTH AND SAFETY PLAN SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HS3B4210	Health and Safety Plan (Hammock)	37	--
HS3B4220	Prepare Draft Health and Safety Plan	18	50%
HS3B4226	Fluor Fernald/DOE Review and Comment	9	70%
HS3B4232	Incorporate Comments and Finalize	9	90%
HS3B4238	Approve Health and Safety Plan	1	100%

All activities are assumed to have a "finish to start" relationship. Progress on the key activities will be tracked and reported based upon the designated milestones identified with the completion of the respective activity.

7.2) Quantification Health and Safety Plan/Health and Safety Requirements Matrix

Labor Resources

The resources for completing the Health and Safety Plan are summarized in Table 1-5.24. No overtime is planned for this activity.

**TABLE 1-5.24**  
**HEALTH AND SAFETY PLAN RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
TPSREP	1.0	Writing plan
TPSMGR	0.2	Safety management input (not projectized)
S&HENG	0.5	Safety engineering input (not projectized)
CNSENS	0.3	Construction input (not projectized)
RADENG	0.3	Radiological engineering input (not projectized)

Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for the Health and Safety Plan are identified in Table 1-5.25.

**TABLE 1-5.25**  
**MATERIALS, ODCS, AND SUBCONTRACTS HEALTH AND SAFETY PLAN**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	--
ODCs	None	--
Subcontracts	None	--

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~~8) Task #8 Title III Engineering Support~~

~~8.1) Plan/Scope Title III Engineering Support~~

~~Fluor Fernald and Jacobs will jointly perform Title III Design responsibilities. The Fluor Fernald team will provide a point of contact for resolving engineering and design issues [i.e., DCNs, requests for clarification of information (RFIs), etc.].~~

~~8.1)1 Subtask #1 Computer Aided Drafting and Design~~

~~Jacobs will provide computer aided drafting and design (CADD) services throughout the Silo 3 Project, Jacobs will be responsible for receiving all "redline" drawings, incorporating DCNs, and maintaining a set of current as built drawings throughout construction and system operability testing (SOT) activities.~~

~~Jacobs will interface with the Fluor Fernald team on-site to ensure that all "redline" drawing information pertaining to FEMP infrastructure drawings are forwarded in a timely manner and incorporated by FEMP Engineering Services CADD personnel.~~

~~8.1)2 Subtask #2 Design Change Notices~~

~~Based on past project experience, it is assumed that eight (8) DCNs will be processed per month throughout the construction, construction acceptance testing and system operability testing phases. Any DCNs, which revise EPA approved documents, must be submitted to the EPA for review and approval.~~

~~8.1)3 Subtask #3 Interface with Equipment Vendors~~

~~During construction and supply of equipment, it will be necessary to interface with vendors regarding fabrication requirements and clarification of specifications. Engineering support for these activities is covered under the scope of the Title III Engineering activity.~~

~~Schedule~~

~~The Title III Engineering Support for the Silo 3 Project is logically tied to the completion of Fluor Fernald acceptance of the Final EDP and the beginning of the preparation of the IFB packages. Title III Engineering Support will complete with cutting Silo 3. Progress on this activity will be apportioned in relation to the progress of the IFB Procurement Processes, Construction, and Construction Acceptance Testing activities.~~

~~8.2) Quantification Title III Engineering Support~~



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Labor Resources

The resources for completing Title III Engineering are summarized in Table 1-5.26. No overtime is planned for this activity.

**TABLE 1-5.26  
TITLE III ENGINEERING RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
CNSMGR	1.0	Project Engineer (projectized)
TPSREP	0.7	Technical support
PRJMGR	0.2	DFS Engineering Manager
TPHO	3.7	Mechanical Engineer (1.0), Electrical Engineer (0.3), System Engineer (1.0), Civil Engineer (0.3), Process Engineer (0.3), Engineering Manager (0.3), CADD Operator (0.5)

Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Title III Engineering are identified in Table 1-5.27.

**TABLE 1-5.27  
MATERIALS, ODCS, AND SUBCONTRACTS — TITLE III ENGINEERING**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	Travel (to Jacobs Oak Ridge)	\$20,000
Subcontracts	None	---

**1.5.2 HS3AB – Design Documentation – Fluor Fernald**

Silo 3 Remedial Design activities, which include Design Documentation, Conceptual Design, Preliminary Design, Final Design, and Title III Engineering Support, will be conducted by the Fluor Fernald and Jacobs engineering team. Jacobs will be the Designer of Record and will perform design under the philosophy of "Design to Cost." The Silos Projects will control cost growth on the FEMP site by completing a design to cost analysis. After each phase of engineering (i.e., Conceptual, Preliminary, Final Design), Fluor Fernald will complete a total cost estimate. The construction cost estimate developed for this Site Closure Baseline will be used as the initial cost estimate. The revised estimates will include the current information from completion of the latest phase of design, plus any design change notices, estimates-to-complete, and trending data. Jacobs will support the design to cost analysis by developing the capital cost estimate for the project at the end of a respective phase of design. Table 1-5.5 provides a summary of the responsibilities of each organization throughout the Remedial Design process.

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**TABLE 1-5.5  
 DESIGN RESPONSIBILITIES MATRIX**

<b>Engineering Deliverable</b>	<b>Responsibilities</b>		
	<b>Fluor Fernald</b>	<b>Jacobs</b>	<b>Others</b>
Design Basis and Requirements Document	<b>Lead</b> – Provide draft functional criteria	<b>Support</b> – Finalize functional criteria and develop design criteria	DOE: Review CAT: Review
Design Data Development	<b>Lead</b> – Develop test plan and report, and manage the work	<b>Support</b> - Review test plan. Incorporate results into design	DOE: Review CAT: Review
Conceptual Design	<b>Lead</b> – Develop technical approach and concept	<b>Support</b> - Prepare drawings and finalize the package	DOE: Review CAT: Review
Technical Baseline	<b>Lead</b> – Define technical scope and manage the technical baseline	<b>Support</b> - Finalize drawings and design basis	DOE: Review CAT: Review
Final Design	<b>Support</b> – Site constructability, operability, safety support	<b>Lead</b> - Prepare CFC packages from preliminary design and vendor data	DOE: Review CAT: Review
Remedial Design Package	<b>Lead</b> – Interface with EPA. Develop non-design components of RD deliverables	<b>Support</b> – Fluor Fernald interface with EPA. <b>Lead</b> - Develop design components of RD deliverables	DOE: Review CAT: Review EPA: Review
Safety Basis Documentation (PHAR/FHAR)	<b>Support</b> – Provide direction and oversight for safety analysis program	<b>Lead</b> - Perform design safety analyses and prepare deliverables	DOE: Review and approve
Health and Safety Plan	<b>Lead</b> – Develop plan.	N/A	N/A
Long Lead Procurement Documentation	<b>Lead</b> – Develop packages and procure equipment and services	<b>Support</b> - Bid package preparation and bid evaluation	DOE: Review CAT: Review
Construction Support (Title III) Documentation	<b>Support</b> – DCN process	<b>Lead</b> - Provide revised drawings/DCN support. Submittal review and approval	DOE: Oversight

The Design Documentation charge number (HS3AB) consists of activities necessary to design the facilities to remediate Silo 3. Design documentation includes the following key tasks:

- Design Data Development
- Remedial Design Package
- Preliminary Hazard Analysis Report
- Health and Safety Plan/Health and Safety Requirements Matrix

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1) Task # 1 – Design Data Development

1.1) Plan/Scope – Design Data Development

Archived Silo 3 material is located at the FEMP. It is assumed that there is a sufficient amount of archived material to provide meaningful data to support the development of design. Design Data Development will be conducted to collect data and verify the effectiveness of the proposed treatment formulation for Silo 3 chemical stabilization, to determine optimum moisture of the Silo 3 material, and to support the development of the design of the Silo 3 treatment process and support facilities. This testing involves the following three key subtasks:

- Design Data Development Work Plan
- Design Data Development
- Design Data Development Test Report

1.1)1 Subtask #1 - Design Data Development Work Plan

The Fluor Fernald Silos Engineering Team will prepare the Design Data Development Work Plan with the support of the DFS Technical Support Team. In accordance with MS-1027, "Laboratory Building Work Planning and Management", (Rev. 1), a work plan and pertinent supporting documentation (i.e., permits, procedures, etc.) will be prepared, reviewed and approved by appropriate personnel, prior to initiating any laboratory activities. The documentation is a comprehensive package which identifies the scope of work, defines responsibilities of project personnel, identifies prerequisites to performing specific activities, identifies health and safety hazards and mitigators, defines procedures to be followed, disposition of all waste generated, drivers, checklists, appropriate permits and sign-offs.

1.1)2 Subtask #2 – Design Data Development

Design Data Development will be conducted at the FEMP on a laboratory-scale using archived Silo 3 material. With the support of Jesse Connor, an internationally known independent consultant, a Fluor Fernald team will refine the stabilization formulation, using data already generated by RMRS in prior treatability efforts. Jesse Connor's support will be obtained through modification of the existing Silos 1 & 2 contract for his services. RMRS will also provide technical support for testing, and Envirobond™ to conduct the tests, per the settlement agreement. A license agreement with RMRS must be executed prior to receiving Envirobond™ for testing. The Design Data Development tests will be conducted with the following objectives:

- Establish optimum moisture of Silo 3 material;
- Verify desired treatment formulation meets the Envirocare waste acceptance criteria;

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- Establish treated waste product's physical, chemical and radiological characteristics; and
- Identify process control parameters and establish an operating envelope.

It is assumed that laboratory samples and laboratory wastes will be properly disposed by the FEMP laboratory directly and would not be returned to the Silo 3 Project.

### 1.1)3 Subtask #3 - Design Data Development Test Report

A Design Data Development Test Report will be developed by Fluor Fernald, reviewed by selected project personnel and finalized. The Design Data Development Test Report will present and summarize the data generated during the testing. The final report will contain the following information (as a minimum):

- Present results of methods used to obtain optimum moisture of Silo 3 material;
- Describe and tabulate treatment formulations tested;
- Present tests and results of desired formulation; and
- Present the desired formulation operating recipe based on the test results.

### Schedule

Table 1-5.6 summarizes the sub-activities and their durations (workdays) for Design Data Development. It is assumed that work in the laboratory cannot begin until the Design Data Development Work Plan is approved.

**TABLE 1-5.6  
DESIGN DATA DEVELOPMENT SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)
HS3K0400	Design Data Development (Hammock)	125
HS3K0436	Prepare Draft Design Data Development Work Plan	20
HS3K0446	Design Data Development Work Plan Review	5
HS3K0450	Incorporate Review Comments and Finalize Design Data Development Work Plan	5
HS3K0452	Approve/Accept Work Plan	5
HS3K0454	Procure Chemicals	20
HS3K0462	Design Data Development Formulation Testing Program	30
HS3K0466	Prepare Draft Design Data Development Test Report	20
HS3K0470	Design Data Development Test Report Review	10
HS3K0472	Incorporate Comments and Finalize Test Report	10

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	HS3K0476	Approve/Accept Design Data Development Test Report	5

All activities are assumed to have a “finish to start” relationship. The project schedule and planned resources also assume that Fluor Fernald will provide a copy of the Design Data Development Work Plan to DOE for information only.

1.2) Quantification – Design Data Development

Labor Resources

The resources for completing Design Data Development are summarized in Table 1-5.7. No overtime is planned for this activity.

**TABLE 1-5.7  
 DESIGN DATA DEVELOPMENT RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
BUYCON	0.2	Procure chemicals
ENGINR	0.2	Guide Test Plan development
ENGPRC	0.3	Chemical Engineer, Process Engineer – Support Test Plan development
INDHYG	0.1	Develop work permits and IH controls
LABCHM	0.8	Lab Tech – Perform laboratory testing
LABMGR	0.1	Approve Test Plan
MVOOPR	0.1	Move drums of Silo 3 material to lab
RADENG	0.5	Develop work permits and radiological controls
RADTEC	0.1	Implement radiological controls
TPSREP	0.7	Support Test Plan development
WSTENG	1.0	Support Test Plan development, WAC input to Test Plan

Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Design Data Development are identified in Table 1-5.8:

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**TABLE 1-5.8**  
**MATERIALS, ODCS, AND SUBCONTRACTS – DESIGN DATA DEVELOPMENT**

ITEM	DESCRIPTION/BASIS	COST
Materials	Treatment chemicals	\$5,000
	Equipment Rental (i.e., table top mixers)	\$10,000
	Consumables	\$5,000
ODCs	None	---
Subcontracts	Independent Consultant – Jesse Connor	\$50,000

2) Task #2 - Remedial Design Package

2.1) Plan/Scope - Remedial Design Package

Fluor Fernald will develop and compile the principal elements of the Conceptual Design Package relating to Silo 3 remediation into a single RD Package for USEPA and OEPA review. The RD Package submitted will be a revision to the RD Package prepared by RMRS and approved by USEPA in September 2000. The RD Package will provide the EPAs with “an understanding of the (Silo 3) design, retrieval, operation and controls necessary to ensure protection of the workers, public, health, safety and the environment.” The following principal elements will be included in the RD Package:

- Process Description<sup>(2)</sup> (Fluor Fernald/Jacobs)
- Retrieval Technology Description<sup>(2)</sup> (Fluor Fernald/Jacobs)
- Process Control Plan<sup>(2)</sup> (Jacobs)
- Sampling and Analysis Plan (Fluor Fernald/Jacobs)
- ~~Operational~~ Environmental Control Plan (Fluor Fernald/Jacobs)
- Transportation and Disposal Plan (Fluor Fernald)
- Silo 3 Gross Decontamination Plan (Fluor Fernald)
- ARARs Compliance Strategy (Fluor Fernald)
- Contingency Plan (Fluor Fernald)
- Health and Safety Controls (Fluor Fernald)
- Environmental Monitoring Plan (Fluor Fernald)
- Process Flow Diagrams<sup>(1)</sup> (Jacobs)
- General Arrangement Drawings<sup>(1)</sup> (Jacobs)
- Heat and Material Balance<sup>(1)</sup> (Jacobs)

<sup>(1)</sup>Documents established in the Technical Baseline

<sup>(2)</sup>Documents established in the Conceptual Design

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#### 2.1)1 Subtask #1 - Process Description

The Process Description will provide an overview description of the process to retrieve, convey, treat and package the Silo 3 material. This document will serve as a guide to the more detailed information presented in the remainder of the RD Package.

#### 2.1)2 Subtask #2 - Retrieval Technology Description

The Retrieval Technology Description will describe the material retrieval performance specification and the retrieval process, as well as documents the contamination control philosophy for entering Silo 3.

#### 2.1)3 Subtask #3 - Process Control Plan

The Process Control Plan will describe the control system for the Silo 3 treatment process. The Silo 3 Project will retrieve and treat the Silo 3 material in accordance with the Envirocare WAC. Fluor Fernald will revise the RMRS Process Control Plan to reflect the new approach.

#### 2.1)4 Subtask #4 - Sampling and Analysis Plan

The Sampling and Analysis Plan (SAP) will describe sampling and analysis for WAC attainment for the treated Silo 3 material. The existing Silo 3 SAP will be revised by Fluor Fernald, to reflect the new sampling approach.

#### 2.1)5 Subtask #5 - Environmental Control Plan

The Environmental Control Plan will describe the methods and materials to be used during the remedial action to control air emissions, fugitive dust, wastewater, stormwater, erosion and waste. The RMRS Operational Environmental Control Plan will be revised by Fluor Fernald to reflect the new approach.

#### 2.1)6 Subtask #6 - Transportation and Disposal Plan

The Transportation and Disposal Plan will provide a detailed description of transportation and disposal operations to ensure safe and successful transportation of treated Silo 3 material to Envirocare. The existing Silo 3 Transportation and Disposal Plan will be revised by Fluor Fernald, to reflect the new transportation and disposal approach.

#### 2.1)7 Subtask # 7 - Silo 3 Gross Decontamination Plan

The Gross Decontamination Plan will describe the proposed methods to remove the "visible Silo 3 material" remaining and apply a fixative to the interior of Silo 3, leaving the silo in a safe configuration for final dismantlement. The definition of "visible Silo 3 material" is material that is obvious to the naked eye, and that, if rubbed or rinsed, would

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be easily removed. The RMRS Silo 3 Gross Decontamination Plan will be revised by Fluor Fernald, to reflect the approach for silo decontamination.

#### 2.1)8 Subtask #8 - ARARs Compliance Strategy

ARARs and TBC requirements were identified in the December 7, 1994, ROD for remedial actions at the OU4. The ARARs Compliance Strategy will identify each ARAR and TBC requirement and the strategy used by the Silo 3 Project to meet the requirement. Fluor Fernald will revise the RMRS ARARs Compliance Matrix to reflect the new approach.

#### 2.1)9 Subtask #9 - Contingency Plan

The Contingency Plan for the remedial action will provide the instructions for response to emergencies and unusual events for Silo 3 Project personnel. This Contingency Plan, in conjunction with the FEMP Emergency Plan will detail the necessary plans and procedures to adequately address emergency situations. The RMRS Contingency Plan will be revised by Fluor Fernald, to reflect any new emergency situations introduced by the new approach.

#### 2.1)10 Subtask #10 - Health and Safety Controls

The Health and Safety Controls (H&SC) section will describe the overall process for the development of safety documentation to support the remedial action phase of the Silo 3 Project. The H&SC is an upper-tier document that will identify specific Silo 3 documents that detail the preventative measures, safety controls, and actions to be taken to mitigate the consequences of occupational, public, and environmental hazards associated with the operations phase of the Silo 3 Project. Fluor Fernald will revise the RMRS H&SC document to reflect the health and safety controls required by the new approach.

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#### 2.1)11 Subtask #11 – Environmental Monitoring Plan

Site-wide environmental monitoring is addressed in the Integrated Monitoring Plan (IEMP), while project-specific requirements are addressed within the environmental control plans, process control plans, and other design documents that constitute the project's RD Package. For the Silo 3 Project and the Silos 1 and 2 Accelerated Waste Retrieval (AWR) Project, modifications to the site-wide environmental program are necessary to support project activities. Therefore, the focus of this plan is to establish the integrated environmental monitoring requirements for OU4 during the conduct of both projects.

#### 2.1)12 Subtask #12 – Process Flow Diagrams

The Process Flow Diagrams (PFDs) will provide a schematic explaining how the process flows from the material feed to the end product. This schematic will identify equipment, piping and instrumentation required by the process. The PFDs will be an excerpt from the Conceptual Design Package.



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## 2.1)13 Subtask #13 – General Arrangement Drawings

The General Arrangement (GA) drawings will provide a graphical depiction/portrayal of the footprint/outline of SSCs for the project. The GA drawings will be an excerpt from the Conceptual Design Package.

## 2.1)14 Subtask #14 – Heat and Material Balance

The Heat and Material Balance will show the mass flow and balance for each material stream anticipated, along with the assumptions supporting the calculations. The Heat and Material Balance will be an excerpt from the Conceptual Design Package.

### Schedule

The schedule for completing the Remedial Design Package is summarized by the following activities in Table 1-5.9:

**TABLE 1-5.9  
REMEDIAL DESIGN PACKAGE SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)
HS3B2910	Remedial Design Package (Hammock)	253
HS3B2920	Update Remedial Design Package	115
HS3B2930	DOE/Fluor Fernald Review Draft RD Package	9
HS3B2940	Incorporate Comments and Finalize Draft RD Package	9
HS3B2950	DOE Review Final Draft RD Package	2
HS3B2960	DOE Submit Final Draft RD Package to EPA	0
HS3B2970	EPA Review Final Draft RD Package	60 (calendar days)
HS3B2980	Fluor Fernald Develop Response to Comments and Prepare Draft Final RD Package	18
HS3B2990	DOE Submit Draft Final RD Package to EPA	4
HS3B3000	EPA Review/Approve Response to Comments and Draft Final RD Package	30 (calendar days)
HS3B3020	Finalize Remedial Design Package	30
HS3B3030	DOE Submit Final RD Package to EPA	4

## 2.2) Quantification - Remedial Design Package

### Labor Resources

The resources for completing the Remedial Design Package are summarized in Table 1-5.10. No overtime is planned for this activity.

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**TABLE 1-5.10**  
**REMEDIAL DESIGN RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
ENSREP	0.3	Sampling – development of Sampling and Analysis Plan
OPRMGR	0.6	Operations input, WPRAP rail operations input
RADENG	0.5	Radiological controls input
TPSREP	1.4	Writing RD package (one resource projectized), regulatory input (shared resource)
WSTENG	0.5	Development of Transportation and Disposal Plan

Jacobs resources for completing the RD Package are included in the Jacobs Conceptual Design (HS3AL), Preliminary Design (HS3AN) and Final Design (HS3AR) accounts.

Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Remedial Design Package are identified in Table 1-5.11.

**TABLE 1-5.11**  
**MATERIALS, ODCS, AND SUBCONTRACTS – REMEDIAL DESIGN PACKAGE**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	None	---

3) Task # 3 - Preliminary Hazard Analysis Report

3.1) Plan/Scope - Preliminary Hazard Analysis Report

The project Safety Basis is defined as the combination of information relating to the control of hazards at a nuclear facility (including design, engineering analysis, and administrative controls), upon which the DOE bases its conclusion that the activities at the facility can be conducted safely. Each project or activity is categorized by its hazards severity following the criteria set forth in DOE-EM-STD-5502-94. The hazard categorization of Silo 3 dictates the documentation required for assessing the hazards associated with the planned activities and establishing the Authorization Basis for performing the activities. The safety basis documentation will progress in parallel to design, with the results of the evaluations and analyses being considered and integrated into the ongoing engineering and design effort. Likewise, as the engineering and design effort evolves, new information and design details will be evaluated by the appropriate safety analysis.

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The safety basis for the Silo 3 Project will consist of the following key safety documents:

- Preliminary Hazard Analysis Report (PHAR)
- Final Hazard Analysis Report (FHAR)

For purposes of the Remedial Design phase of this project, only the PHAR will be prepared. The FHAR will be discussed in Section 1.5.5 (Task #3), under the Startup/Startup Review portion of the Silo 3 Closure Plan.

In parallel to the ongoing development of the Conceptual Design Package, Fluor Fernald Safety Analysis team members will revise the existing Silo 3 safety basis documents developed by RMRS, including the PHAR, HCCs, Accident Analysis, Integrated Hazard Analysis (IHA), Fire Hazard Analysis (FHA), and Human Factors Evaluation (HFE), to reflect the new approach consistent with DOE-STD-3009-94, Chapters 1-5. A PHAR is required for DOE authorization to procure, construct and test a new HC3 facility. The PHAR will be developed to identify safety design criteria, analyze potential hazards, propose measures to eliminate, control, or mitigate these hazards, and analyze potential risks. The PHAR will be supported by the following structured evaluations and analyses using engineering design information from the evolving Conceptual Design Package:

- HCCs
- Accident Analysis
- ALARA Analysis
- IHA
- FHA
- Human Factors Evaluation (HFE)

Currently Silo 3 is classified as a HC3 non-reactor nuclear facility based on the inventory of radioactive material and on the accident analysis for a silo dome failure. From a Nuclear and Systems Safety standpoint, the Silo 3 retrieval activity must be evaluated to determine whether the activity will put a greater amount of material at risk than previously evaluated and if so, whether the amount will exceed the HC2 thresholds. In addition, Fluor Fernald, must evaluate whether the approach will increase the probability of the bounding accident – Silo dome failure.

A Technical Safety Requirement (TSR) for the OU4 Silos was developed to provide controls to reduce the probability of the bounding accident occurring. Therefore, a structural evaluation (performed during conceptual design) will be required to verify that cutting an opening in Silo 3 would not increase the probability of dome failure. However, based on a preliminary analysis of this retrieval approach, controls, such as containment, would be required to mitigate a potential release of exposed material, but the hazard categorization of the facility would not change.

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Schedule

The preparation of the PHAR and its supporting documentation will continue seamlessly following the preparation of the Conceptual Design Package. Any changes in the document would be incorporated as appropriate into the PHAR. The schedule for the PHAR and its supporting documentation is summarized by activity in Table 1-5.12.

**TABLE 1-5.12  
PRELIMINARY HAZARD ANALYSIS REPORT SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
Safety Basis Support Documentation			
HS3B3524	Preliminary IHA		--
HS3B3526	Preliminary HCCs		--
HS3B3528	Preliminary Accident Analysis		--
HS3B3530	Preliminary ALARA Analysis		--
HS3B3532	Preliminary FHA		--
HS3B3536	Preliminary HFE		--
Safety Basis Document			
HS3B3510	Preliminary Hazard Analysis Report (Hammock)	144	--
HS3B3520	Prepare Silo 3 Draft PHAR	27	40%
HS3B3582	Fluor Fernald Review/Revise Draft PHAR	14	45%
HS3B3586	DOE Review Draft PHAR	14	50%
HS3B3590	Incorporate DOE Comments and Finalize PHAR	9	60%
HS3B3592	ISRC Review PHAR	9	65%
HS3B3594	Incorporate ISRC Comments	9	70%
HS3B3598	Fluor ISRC Accepts PHAR	9	75%
HS3B3600	DOE Review PHAR	25	80%
HS3B3620	Incorporate DOE Comments	18	90%
HS3B3630	DOE Approves PHAR	10	--
HS3B3640	DOE Issues PHAR SER	0	100%

Incremental progress on the support documentation components will be difficult to quantify based upon the evolution of the engineering and design effort. This documentation is prepared in parallel and can affect each other significantly. Therefore, for reporting purposes progress on the key activities will be tracked and reported based upon the designated milestones identified with the completion of the respective activity.

DOE approval of the PHAR establishes the authorization for procurement, construction and pre-operational testing for the Silo 3 Project. Fluor Fernald will request that procurement for vendor design be allowed prior to approval of the PHAR, but no equipment fabrication will occur until DOE approval of the PHAR is received.

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### 3.2) Quantification - Preliminary Hazard Analysis Report

#### Labor Resources

The resources for completing the PHAR are summarized in Table 1-5.13. No overtime is planned for this activity.

**TABLE 1-5.13  
PRELIMINARY HAZARD ANALYSIS REPORT RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
FPRENG	0.1	Input for FHA analysis
HAZWAT	0.1	Input for IHA analysis
INDHYG	0.2	Input for IHA analysis
RADENG	0.5	Input for IHA and ALARA Analysis input

In addition to these labor resources, which have been included in the Silo 3 baseline, there are several centralized resources, which are needed to support the development and review of the PHAR, but are not included in this baseline. These include: safety analysis personnel and management, human factors engineering, and ALARA committee management.

Jacobs resources for completing the PHAR are included in the Jacobs Conceptual Design (HS3AL), Preliminary Design (HS3AN) and Final Design (HS3AR) accounts.

#### Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for the Preliminary Hazard Analysis Report are identified in Table 1-5.14.

**TABLE 1-5.14  
MATERIALS, ODCS, AND SUBCONTRACTS – PRELIMINARY HAZARD ANALYSIS REPORT**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	None	---

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4) Task #4 - Health and Safety Plan/Health and Safety Requirements Matrix

4.1) Plan/Scope - Health and Safety Plan/Health and Safety Requirements Matrix

In addition to the safety basis documentation, a Health and Safety Plan (HASP) and Project-Specific Health and Safety Requirements Matrix (PSHSRM) will be developed by Fluor Fernald to cover the construction, remedial action, and facility shutdown phases of the project. The HASP will identify the health and safety requirements for the Silo 3 Project and will be accompanied by the PSHSRM, which outlines the minimum medical, radiological, industrial hygiene, safety and training requirements to perform the planned activities. The PSHSRM includes a hazard analysis for each task and required mitigators; including personal protective equipment, engineering and administrative controls, pre-job planning and permits, personnel and air monitoring, medical monitoring and medical surveillance, and decontamination and disposal procedures.

The HASP will also identify the radiological hazards of the Silo 3 Project and controls (e.g., engineering and administrative controls, personal protective equipment (PPE), etc.) to mitigate those hazards, as well as the project's ALARA goals. A separate Health Physics Plan (HPP) will not be prepared.

Schedule

The schedule for the Health and Safety Plan is summarized by the activities in Table 1-5.15. This schedule assumes that a copy will be provided to DOE for information.

**TABLE 1-5.15  
 HEALTH AND SAFETY PLAN SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HS3B4210	Health and Safety Plan (Hammock)	37	--
HS3B4220	Prepare Health and Safety Plan	18	50%
HS3B4226	Fluor Fernald/DOE Review and Comment	9	70%
HS3B4232	Incorporate Comments and Finalize	9	90%
HS3B4238	Approve Health and Safety Plan	1	100%

All activities are assumed to have a "finish to start" relationship. Progress on the key activities will be tracked and reported based upon the designated milestones identified with the completion of the respective activity.

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## 7.2) Quantification - Health and Safety Plan/Health and Safety Requirements Matrix

### Labor Resources

The resources for completing the Health and Safety Plan are summarized in Table 1-5.16. No overtime is planned for this activity.

**TABLE 1-5.16  
HEALTH AND SAFETY PLAN RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
INDHYG	0.2	IH input (not projectized)
RADENG	0.5	Radiological engineering input (not projectized)
S&HENG	0.5	Safety engineering input (not projectized)

### Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for the Health and Safety Plan are identified in Table 1-5.17.

**TABLE 1-5.17  
MATERIALS, ODCS, AND SUBCONTRACTS – HEALTH AND SAFETY PLAN**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	None	---

### 1.5.2a HS3AK – Conceptual Design (Fluor Fernald) HS3AL – Conceptual Design (Jacobs)

The conceptual design will be conducted by a team of Fluor Fernald and Jacobs personnel. To track spending, separate charge accounts have been set up for each organization. Each organization will charge time to their applicable charge number for the Conceptual Design activities they are responsible for (see Table 1-5.5). The overall scope of work for conceptual design is as follows:

#### 1) Task # 1 - Conceptual Design

##### 1.1) Plan/Scope – Conceptual Design

As part of Conceptual Design, Fluor Fernald and Jacobs will prepare a Design Basis and Requirements Document to define the Functional Requirements, Design Criteria, and

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ARARs Technical Requirements for the project. In parallel to the development of the Design Basis and Requirements Document, work on the Conceptual Design Package will be initiated.

A preliminary structural evaluation has been conducted prior to the baseline to verify that the structural integrity of Silo 3 would not be compromised by cutting an opening in the silo. A more detailed evaluation will be conducted during conceptual design to determine whether reinforcement of the opening may be required. Mechanical excavation would not require that any loads be placed on the silo dome. Jacobs, with consult from a post-tensioning tank specialist, will perform structural calculations and develop and approve the plans for cutting an opening at the bottom of the silo wall, and develop appropriate plans for this process. These calculations will determine if reinforcing of the silo is required. It is assumed that reinforcement of the opening will be required and that \$100,000 of structural steel or bands will be required. The quantity of reinforcing will be determined during design, and is not known at the time of baseline preparation. It is assumed that a 20' h x 15' w opening can be cut.

Fluor Fernald will also work with the IT Group to capitalize on the lessons learned at WPRAP on material handling and radiological control, amongst other issues. Fluor Fernald will capitalize on the design work and procedures already in place at WPRAP to ensure the Silo 3 design is able to support rail operations. Fluor Fernald will also rely on outside expertise from the bulk material flow industry to support the development of the material handling design. Jenike and Johanson, Inc. will provide input into the design and operations parameters for the Silo 3 Project and provide guidance on how the Silo 3 material will behave during retrieval, conveyance, etc., given its characteristics. Fluor Fernald may also utilize Jenike and Johanson to provide guidance on the selection of retrieval and conveyance equipment.

The Conceptual Design Package will consist of the following documents covering the major systems:

- Process and Mechanical Flow Diagrams
- Heat and Material Balances
- Process Descriptions
- Piping and Instrument Diagrams
- General Arrangement Drawings
- Electrical Single Line Diagrams
- Site Plot Plans
- HVAC Flow and Control Diagrams
- Draft Equipment List including Specialty Equipment
- Construction Cost Estimate and Schedule from Site Closure Baseline

To comply with agency requirements for the submittal of the RD Package, and ensure that the Conceptual Design contains the necessary level of detail to provide the technical solution, the Silo 3 Conceptual Design Package will also contain draft versions of many of



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the documents that are normally considered to be part of Preliminary Design, including the following:

- Data Sheets and Draft Specifications
- Electrical Load Summary
- Performance Grading
- List of Drawings, Specifications, and Other Documents
- Retrieval Technology Description
- Process Control Plan
- Erosion/Drainage Control Drawings
- Tie-In List
- Motor List
- Radiological Zone Drawing

The Technical Baseline will be established prior to the start of Preliminary Design. The Technical Baseline is that collection of design basis and process information that is of sufficient detail to assure consistency of approach and process during subsequent design phases (Preliminary and Final Design). The significance of the Technical Baseline is that it is used to manage changes to the design in an approved and controlled manner. The Technical Baseline will be developed from the documents listed below. It essentially consists of the versions of most of the elements from the Conceptual Design Package and the Design Basis and Requirements Document (Rev. 0).

- Design Basis and Requirements Document
- Process and Mechanical Flow Diagrams
- Heat and Material Balances
- Piping and Instrument Diagrams
- General Arrangement Drawings
- Electrical Single Line Diagrams

Upon issuance of the Technical Baseline, the formal change control process will be required to effect changes to these documents.

In support of the "Design to Cost" philosophy, Fluor Fernald will complete a total cost estimate at the completion of Conceptual Design. The estimate will include the current information from completion of the conceptual design, plus any ETC and trending data. Jacobs will support the design to cost analysis by developing the capital cost estimate for the project at the end of conceptual design.

### Schedule

The schedule for completing the conceptual design is summarized by the following activities in Table 1-5.18:

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**TABLE 1-5.18  
 CONCEPTUAL DESIGN SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)
HS3L0120	Conceptual Design Package (Hammock)	195
HS3L0140	Prepare Conceptual Design Package (CDP), Rev. A	125
HS3L3678	Kickoff Review Process – CDP, Rev. A	0
HS3L3682	Fluor Fernald Review CDP, Rev. A	10
HS3L3686	Fluor Fernald Prepare Comment Response Document	5
HS3L3700	Jacobs Revise CDP, Rev. A to CDP, Rev. B	10
HS3L4116	Silo 3 Conceptual Design Cost Estimate and Schedule	30
HS3L4270	DOE Review CDP, Rev. B <sup>1</sup>	20
HS3L4300	Fluor Fernald/Jacobs Prepare DOE Comment Response Document	5
HS3L4310	Jacobs Revise CDP, Rev. B to CDP, Rev. 0	10
HS3L4320	Issue Final Silo 3 CDP/Establish Tech. Baseline	0

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<sup>1</sup> This review by DOE is being conducted to meet the requirement of DOE Order 413.3 for Critical Decision Point, CD-2.

Jacobs Engineering will report performance utilizing two earned value methods – discrete milestones based on product deliverables, and level of effort (LOE) support activities. Each Silos project is subdivided into systems, which are further divided into activities. Due to the relatively small size of the Silo 3 project design, the Silo 3 project will be treated as one system for the purposes of reporting earned value. Specific milestones for reporting earned value by Jacobs Engineering will be defined in the Silos Project Engineering Execution Plan. Fluor Fernald performance will be apportioned based on the reported Jacobs performance.

In parallel to development of the conceptual design, modifications to the CSX rail tender will be pursued. A modification will be obtained with CSX by DOE to allow shipment of the LSA-II Silo 3 material under the existing CSX tender.

#### 1.2) Quantification – Conceptual Design

##### Labor Resources

The Fluor Fernald resources for completing the Conceptual Design are summarized in Table 1-5.19. Many design resources, except the project engineer, are shared resources with other Silos projects, and are not projectized to the Silo 3 Project. Jacobs resources for

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completing Conceptual Design are summarized in Table 1-5.20. No overtime is planned for this activity.

**TABLE 1-5.19**  
**CONCEPTUAL DESIGN RESOURCE SUMMARY – FLUOR FERNALD (HS3AK)**

RESOURCE CODE	FTEs	COMMENTS
CHMOPR	0.1	Operator input into design
CNSENG	1.3	Constructability input to design, with input on construction procurement strategy from full time Silo 3 CCM
DRFCAD	0.2	Site/Engineering drawings
ENGCVL	0.5	Design development, structural analysis oversight
ENGINR	2.8	Project Engineer, engineering design development
ENGMEC	0.1	Design development
ENGPRC	0.3	Design development
ENPREP	0.2	Radon compliance
FPRENG	0.2	Fire protection input to design
INDHYG	0.3	S&H development
OPRMGR	0.7	Operability input to design
PJSREP	1.1	Maintenance input to design
QACMGR	0.2	Input on shipping/DOT issues
RADENG	0.5	Radiological input
TPSREP	2.5	Input to design, documentation/workplan development, radiological controls development, regulatory input
WSTENG	0.4	Container approval, input on Envirocare issues
WSTMGR	0.1	WAO input to design, PWID development

**TABLE 1-5.20**  
**CONCEPTUAL DESIGN RESOURCE SUMMARY – JACOBS (HS3AL)\***

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RESOURCE CODE	FTEs	COMMENTS
TPHO {Jacobs}	10.4	Process Eng. (1.6), Process Design (0.4), Civil Eng. (0.1), Civil Design (0.1), Structural Eng. (0.4), Electrical Eng. (0.6), Electrical Design (0.3), I&C Eng. (0.5), I&C Design (0.1), Mechanical Eng. (2.4), Mechanical Design (0.6), Piping Eng. (0.4), Piping Design (0.2), Architectural Eng. (0.3), Project Mgmt. (0.2), Eng. Mgmt (0.4), Admin Support (0.2), CADD Support (0.2), Project Controls (0.3), Contract Admin (0.1), Document Control (0.2), Business Services (0.1), ESH (0.2), QA (0.2), Estimating (0.3)

\* Jacobs labor summary is included here for information. The costs of Jacobs labor and ODCs are included as subcontract dollars (Table 1-5.22).

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Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Conceptual Design – Fluor Fernald (HS3AK) are identified in Table 1-5.21. Table 1-5.22 identifies the subcontract dollars ODCs for Conceptual Design – Jacobs (HS3AL).

**TABLE 1-5.21  
MATERIALS, ODCS, AND SUBCONTRACTS –CONCEPTUAL DESIGN (HS3AK)**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	FF Travel (Biweekly trip to Jacobs- Oak Ridge)	\$9,000
	FF Travel (to Vendors)	\$12,500
	FF Travel (to Jacobs – Oak Ridge for Over-the-Shoulder Reviews)	\$7,500
Subcontracts	IT Group (design support)	\$166,740
	Jenike and Johanson (design support)	\$144,000
	Coleman (operability/startup input)	\$24,000

**TABLE 1-5.22  
SUBCONTRACTS ODCS –CONCEPTUAL DESIGN (HS3AL)**

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ITEM	DESCRIPTION/BASIS	COST
Subcontracts ODCs	Jacobs (includes labor and travel)	\$1,278,295 <del>\$78,500</del>

1.5.2b HS3AM – Preliminary Design (Fluor Fernald)  
HS3AN – Preliminary Design (Jacobs)

The preliminary design will be conducted by a team of Fluor Fernald and Jacobs personnel. To track spending, separate charge accounts have been set up for each organization. Each organization will charge time to their applicable charge number for the preliminary design activities they are responsible for (see Table 1-5.5). The overall scope of work for preliminary design is as follows:

1) Task #1 - Preliminary Design

1.1) Plan/Scope - Preliminary Design

Upon submittal of the Conceptual Design Package to DOE, Jacobs Engineering, with the support of Fluor Fernald will prepare a Preliminary Design Package, which provides the design and specifications necessary to construct and operate equipment for Silo 3 remedial action.



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During this scope of work, the design constructability review process will also be performed. The design constructability review process involves evaluating and integrating practical construction practices and requirements into the design configuration by ensuring safety; efficiency; cost and schedule benefits; productivity in field construction operations; safe accessibility of personnel, material, and equipment; facilitation of construction during adverse weather; sequencing activities to facilitate system turnover and start up; and the use of innovative construction methods to enhance constructability. Constructability reviews also include waste planning, and decontamination planning.

Because the technical solution to Silo 3 remediation will be developed during Conceptual Design and the majority of Silo 3 equipment is expected to be long lead, there will not be a specific Preliminary Design Package. This approach to Preliminary Design will allow for the incorporation of equipment designs into process and mechanical flow diagrams, confirm general arrangement and safety basis documentation, and provide timely delivery during construction.

Preliminary Design will consist of the following:

- Long lead procurement specifications
- Preliminary structural steel design and drawings
- Preliminary concrete design and drawings

Specifications will be reviewed by Fluor Fernald and Jacobs prior to issuance for bid. The DOE and CAT will be asked to review specifications in parallel with the Fluor Fernald and Jacobs team. Specifications will be reviewed as they are completed and not as a single package.

In support of the "Design to Cost" philosophy, Fluor Fernald will complete a total cost estimate at the completion of Preliminary Design. The estimate will include the current information from completion of the preliminary design, plus any DCN, ETC, and trending data. Jacobs will support the design to cost analysis by developing the capital cost estimate for the project at the end of preliminary design.

### Schedule

The schedule for completing preliminary design is summarized by the following activities in Table 1-5.23. Many of the activities shown will be performed in parallel. These activities represent the major components of the preliminary design phase.

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**TABLE 1-5.23  
 PRELIMINARY DESIGN SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)
HS3N0110	Preliminary Design Phase (PDP) (Hammock)	70
HS3N0128	Prepare Silo 3 Procurement Plan	15
HS3N0150	Maintain Design Basis and Requirements Document	52
HS3N1000	PDP Technical Baseline Management – Civil, Structural, Architectural	52
HS3N1080	Prepare Building Containment Long Lead Specs and Data Sheets	20
HS3N2000	PDP Technical Baseline Management – Mech/Process	52
HS3N2160	FF Prepare Mechanical/Process Bid Packages	60
HS3N3000	PDP Technical Baseline Management – Electrical/I&C	52
HS3N3080	Prepare I&C Bid Packages	50
HS3N4300	Silo 3 Preliminary Design Cost Estimate	30

Jacobs Engineering will report performance utilizing two earned value methods – discrete milestones based on product deliverables, and level of effort (LOE) support activities. Each Silos project is subdivided into systems, which are further divided into activities. Due to the relatively small size of the Silo 3 project design, the Silo 3 project will be treated as one system for the purposes of reporting earned value. Specific milestones for reporting earned value by Jacobs Engineering will be defined in the Silos Project Engineering Execution Plan. Fluor Fernald performance will be apportioned based on the reported Jacobs performance.

## 1.2) Quantification - Preliminary Design

### Labor Resources

The Fluor Fernald resources for completing the Preliminary Design are summarized in Table 1-5.24. Many design resources, except the project engineer, are shared resources with other Silos projects, and are not projectized to the Silo 3 Project. Jacobs resources for completing Preliminary Design are summarized in Table 1-5.25. No overtime is planned for this activity.

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**TABLE 1-5.24**  
**PRELIMINARY DESIGN RESOURCE SUMMARY – FLUOR FERNALD (HS3AM)**

RESOURCE CODE	FTEs	COMMENTS
BUYCON	1.0	Contract administrator/buyer (projectized)
CHMOPR	0.1	Operator input into design
CNSENG	1.3	Constructability input to design, with input on construction procurement strategy from full time Silo 3 CCM
DRFCAD	0.2	Site/Engineering drawings
ENGCVL	0.5	Design development
ENGINR	2.9	Project Engineer, engineering design development,
ENGMEC	0.2	Design development
ENGPRC	0.3	Design development
ENPREP	0.2	Radon compliance
FPRENG	0.2	Fire protection input to design
INDHYG	0.3	S&H development
OPRMGR	0.9	Operability input to design, Rail operations input
PJSREP	1.1	Maintenance input to design
PURMGR	1.0	Purchasing Manager support
QACENG	1.0	QA/QC input into design
QACMGR	0.1	Input on shipping/DOT issues
RADENG	0.5	Radiological input into design
TPSREP	3.0	Input to design, documentation/workplan development, S&H input, regulatory input
WSTENG	0.5	Container approval, input on Envirocare issues, rail operations input
WSTMGR	0.1	WAO input to design, PWID development

**TABLE 1-5.25**  
**PRELIMINARY DESIGN RESOURCE SUMMARY – JACOBS (HS3AN)\***

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RESOURCE CODE	FTEs	COMMENTS
TPHO (Jacobs)	26.2	Process Eng. (2.1), Process Design (0.3), Civil Eng. (0.6), Civil Design (0.2), Structural Eng. (1.4), Structural Design (0.3), Electrical Eng. (1.9), Electrical Design (2.0), I&C Eng. (2.2), I&C Design (1.4), Mechanical Eng. (4.3), Mechanical Design (2.0), Piping Eng. (1.3), Piping Design (0.6), Architectural Eng. (0.5), Project Mgmt. (0.3), Eng. Mgmt (0.5), Admin Support (0.4), CADD Support (0.3), Project Controls (0.4), Contract Admin (0.2), Document Control (0.3), Business Services (0.2), ESH (0.7), QA (0.4), Estimating (1.4)

\* Jacobs labor summary is included here for information. The costs of Jacobs labor and ODCs are included as subcontract dollars (Table 1-5.27) .



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**Materials, ODCs, and Subcontracts**

The materials, ODCs, and subcontracts for Preliminary Design – Fluor Fernald (HS3AM) are identified in Table 1-5.26. Table 1-5.27 identifies the ODCs for Preliminary Design – Jacobs (HS3AN).

**TABLE 1-5.26  
MATERIALS, ODCS, AND SUBCONTRACTS – PRELIMINARY DESIGN - (HS3AM)**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	FF Travel (Biweekly trip to Jacobs- Oak Ridge)	\$4,326
	FF Travel (to Vendors)	\$16,176
	FF Travel (to Jacobs – Oak Ridge for Over-the-Shoulder Reviews)	\$7,195
Subcontracts	IT Group (design support)	\$60,480
	Jenike and Johanson (design support)	\$44,000
	Coleman (operability/startup input)	\$8,602

Long lead and other equipment, which is procured as part of the preliminary design phase, are budgeted in the construction management account. Thus, an accurate estimate of capital equipment required for the project is captured in one account, regardless of the time that the equipment is purchased.

**TABLE 1-5.27  
SUBCONTRACTS ODCS –PRELIMINARY DESIGN - (HS3AN)**

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ITEM	DESCRIPTION/BASIS	COST
Subcontracts ODCs	Jacobs (includes labor and travel)	\$1,289,844
		\$84,000

**1.5.2c      HS3AP – Final Design (Fluor Fernald)  
HS3AR – Final Design (Jacobs)**

The final design will be conducted by a team of Fluor Fernald and Jacobs personnel. To track spending, separate charge accounts have been set up for each organization. Each organization will charge time to their applicable charge number for the final design activities they are responsible for (see Table 1-5.5). The overall scope of work for final design is as follows:

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1) Task #1 – Final Design

1.1) Plan/Scope – Final Design

Detail from the conceptual design will be developed, incorporating details of long-lead procurements and vendor-designed equipment, adding remaining specifications and drawings for construction of the complete process, into a Final Design Package. Final Design activities commence with award of procurement contracts to vendors. JEG will prepare the Final Design Package, which will consist of three bid packages: civil/structural, mechanical, and electrical/instrumentation. Major equipment estimated for the Silo 3 Project is described in Sections 1.5.3 and 1.5.4. The following documents will subsequently be developed during Final Design:

Process and Mechanical Flow Diagrams<sup>1</sup>

Heat and Material Balances<sup>1</sup>

Piping and Instrument Diagrams<sup>1</sup>

General Arrangement Drawings<sup>1</sup>

Electrical Single Line Diagrams<sup>1</sup>

Site Plot Plans<sup>1</sup>

HVAC Flow and Control Diagrams

Electrical Load Summary

Data Sheets and Draft Specifications for Key Equipment and Long-Lead Procurement Items

Equipment List including Specialty Equipment

List of Drawings, Specifications, and Other Documents

Performance Grading

Control System Block Diagrams

Civil Utility Plans (Interface between all 3 Silos projects)

Process Control Plan

Instrument List

Instrument Data Sheets

Key Calculations

Underground Piping Drawings

Control Room Arrangements

Lightning Protection and Grounding Design

Grading, Drainage, and Paving Plans

Construction Cost Estimate and Schedule

Software Programming

Instrument Installation Details

Instrument Loop Diagrams

Line List

Valve List

Construction Cost Estimate, and Assessment of Design to Cost

<sup>(1)</sup> Documents established in the Technical Baseline.

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Fluor Fernald Safety Analysis team members will closely interface with Jacobs throughout the development of the final design to ensure consistency, continuity, and completeness with the safety basis documentation. All the appropriate parties (i.e., engineering, construction, operations, etc.) will be involved in the review of the design package, so that the verification of the Final Design Package will satisfy the requirements of the Fluor Fernald Procedure ED-12-4010, "Design Verification," (Rev. 7).

In support of the "Design to Cost" philosophy, Fluor Fernald will complete a total cost estimate at the completion of Final Design. The estimate will include the current information from completion of the final design, plus any DCN, ETC, and trending data. Jacobs will support the design to cost analysis by developing the capital cost estimate for the project at the end of final design.

### Schedule

The schedule for completing the Final Design is summarized by the following activities in Table 1-5.27a:

**TABLE 1-5.27a**  
**FINAL DESIGN SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)
HS3R0130	Final Design (Hammock)	157
HS3R1000	Finalize CSA Final Design Package (Hammock)	60
HS3R1096	Prepare CSA Final Design Package	5
HS3R1104	Fluor Fernald Review CSA Final Design Package	1.0
HS3R1108	Incorporate Fluor Fernald CSA Final Design Package Comments	5
HS3R1112	DOE Review CSA Final Design Package <sup>1</sup>	20
HS3R1116	Resolve/Incorporate DOE CSA Final Design Package Review Comments	10
HS3R1120	Issue CSA Final Design Package CFC	2
HS3R2000	Finalize Mechanical/Process Final Design Package (Hammock)	80
HS3R2138	Prepare Mechanical/Process Final Design Package	5
HS3R2148	Fluor Fernald Review Mechanical/Process Final Design Package	10
HS3R2152	Incorporate Fluor Fernald Mechanical/Process Final Design Package Comments	5
HS3R2156	DOE Review Mechanical/Process Final Design Package <sup>1</sup>	20

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ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)
HS3R2160	Resolve/Incorporate DOE Mechanical/Process Final Design Package Review Comments	10
HS3R2164	Issue Mechanical/Process Final Design Package CFC	2
HS3R3000	Finalize Elec/I&C Final Design Package (Hammock)	100
HS3R3116	Prepare Elec/I&C Final Design Package	5
HS3R3124	Fluor Fernald Review Elec/I&C Final Design Package	10
HS3R3128	Incorporate Fluor Fernald Elec/I&C Final Design Package Comments	5
HS3R3132	DOE Review Elec/I&C Final Design Package <sup>1</sup>	20
HS3R3136	Resolve/Incorporate DOE Elec/I&C Final Design Package Review Comments	10
HS3R3140	Issue Elec/I&C Final Design Package CFC	2

<sup>1</sup> These reviews by DOE are being conducted to meet the requirement of DOE Order 413.3 for Critical Decision Point, CD-3.

Jacobs Engineering will report performance utilizing two earned value methods – discrete milestones based on product deliverables, and level of effort (LOE) support activities. Each Silos project is subdivided into systems, which are further divided into activities. Due to the relatively small size of the Silo 3 project design, the Silo 3 project will be treated as one system for the purposes of reporting earned value. Specific milestones for reporting earned value by Jacobs Engineering will be defined in the Silos Project Engineering Execution Plan. Fluor Fernald performance will be apportioned based on the reported Jacobs performance.

### 1.3) Quantification - Final Design

#### Labor Resources

The Fluor Fernald resources for completing the Final Design are summarized in Table 1-5.27b. Many design resources, except the project engineer, are shared resources with other Silos projects, and are not projectized to the Silo 3 Project. Jacobs resources for completing Final Design are summarized in Table 1-5.27c. No overtime is planned for this activity.

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**TABLE 1-5.27b**  
**FINAL DESIGN RESOURCE SUMMARY – FLUOR FERNALD (HS3AP)**

RESOURCE CODE	FTEs	COMMENTS
BUYCON	0.5	Contract administrator/buyer (projectized)
CHMOPR	0.1	Operator input into design
CNSENG	1.3	Constructability input to design, construction procurement input
DRFCAD	0.1	Site/Engineering drawings
ENGCVL	0.5	Design development
ENGINR	2.9	Project Engineer, engineering design development,
ENGMEC	0.8	Design development, startup input
ENGPRC	0.3	Design development
ENPREP	0.1	Radon compliance
FPRENG	0.1	Fire protection input to design (not projectized)
INDHYG	0.2	S&H development
OPRMGR	0.9	Operability input to design, Rail operations input
PJSREP	1.1	Maintenance input to design
PURMGR	1.0	Purchasing Manager support
QACENG	0.5	Quality input into design
QACMGR	0.1	Input on shipping/DOT issues
RADENG	0.5	Radiological input to design
TPSREP	3.0	Input to design, documentation/workplan development, S&H input, regulatory input
WSTENG	0.5	Container approval, input on Envirocare issues, rail operations input
WSTMGR	0.1	WAO input to design, PWID development

**TABLE 1-5.27c**  
**FINAL DESIGN RESOURCE SUMMARY – JACOBS (HS3AR)\***

RESOURCE CODE	FTEs	COMMENTS
TPHO (Jacobs)	15.0	Process Eng. (0.4), Civil Eng. (0.4), Civil Design (0.2), Structural Eng. (2.1), Structural Design (1.1), Electrical Eng. (0.4), Electrical Design (0.4), I&C Eng. (1.4), I&C Design (1.1), Mechanical Eng. (1.3), Mechanical Design (0.4), Piping Eng. (0.3), Piping Design (0.1), Architectural Eng. (0.5), Project Mgmt. (0.3), Eng. Mgmt (0.4), Admin Support (0.4), CADD Support (0.3), Project Controls (0.4), Contract Admin (0.2), Document Control (0.4), Business Services (0.2), ESH (0.9), QA (0.4), Estimating (1.0)

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\* Jacobs labor summary is included here for information. The costs of Jacobs labor and ODCs are included as subcontract dollars (Table 1-5.27e) .

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Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Final Design - Fluor Fernald (HS3AP) are identified in Table 1-5.27d. Table 1-5.27e identifies the ODCs for Final Design - Jacobs (HS3AR).

**TABLE 1-5.27d  
MATERIALS, ODCS, AND SUBCONTRACTS – FINAL DESIGN (HS3AP)**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	FF Travel (Biweekly trip to Jacobs- Oak Ridge)	\$8,652
	FF Travel (to Vendors)	\$12,132
	FF Travel (to Jacobs – Oak Ridge for Over-the-Shoulder Reviews)	\$7,195
Subcontracts	IT Group (design support)	\$28,800
	Jenike and Johanson (design support)	\$20,000
	Coleman (Operability/startup input)	\$9,730

**TABLE 1-5.27e  
SUBCONTRACTS ODCS –FINAL DESIGN - (HS3AR)**

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ITEM	DESCRIPTION/BASIS	COST
Subcontracts ODCs	Jacobs (includes labor and travel)	\$1,652,851 <del>\$160,500</del>

1.5.2d      HS3AS – Title III Support (Fluor Fernald)  
              HS3AT- Title III Support (Jacobs)

1) Plan/Scope - Title III Engineering Support

Jacobs will provide design support during the Construction phase of the Silo 3 Project. This effort will include the following activities and deliverables:

- Approve vendor submittals
- Participate in equipment inspection and tests during fabrication
- Participate in equipment receipt inspection
- Participate in field inspection during construction
- Disposition Nonconformance Reports under the direction of the Project Quality Manager
- Process Request for Clarification of Information and Design Change Notices (DCN)
- Prepare Record Drawings from Construction Redline Drawings
- Participate in systems start-up and turnover to Operations

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The Fluor Fernald team will provide a point-of-contact for resolving engineering and design issues [i.e., DCNs, requests for clarification of information (RFIs), etc.].

1.1)1 Subtask #1 - Computer Aided Drafting and Design

Jacobs will provide computer aided drafting and design (CADD) services throughout the Silo 3 Project, Jacobs will be responsible for receiving all "redline" drawings, incorporating DCNs, and maintaining a set of current as-built drawings throughout construction and system operability testing (SOT) activities.

Jacobs will interface with the Fluor Fernald team on-site to ensure that all "redline" drawing information pertaining to FEMP infrastructure drawings are forwarded in a timely manner and incorporated by FEMP Engineering Services CADD personnel.

1.1)2 Subtask #2 - Design Change Notices

Based on past project experience, it is assumed that eight (8) DCNs will be processed per month throughout the construction, construction acceptance testing and system operability testing phases. Any DCNs, which revise EPA-approved documents, must be submitted to the EPA for review and approval.

1.1)3 Subtask#3 - Interface with Equipment Vendors

During construction and supply of equipment, it will be necessary to interface with vendors regarding fabrication requirements and clarification of specifications. Equipment receipt inspection and inspection of equipment during construction will also occur. Engineering support for these activities is covered under the scope of the Title III Engineering activity.

Schedule

The Title III Engineering Support for the Silo 3 Project is logically tied to the completion of Fluor Fernald acceptance of the Final Design Package and the beginning of the preparation of the IFB packages. Title III Engineering Support for Fluor Fernald resources will complete with completion of the ORR. After this time, engineering support is resource loaded in the Operations charge number (HS3AF). Progress on this activity will be apportioned in relation to the progress of the IFB Procurement Processes, Construction, Construction Acceptance Testing activities, and Startup activities.

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## 1.2) Quantification - Title III Engineering Support

### Labor Resources

The Fluor Fernald resources for completing the Title III Engineering (HS3AS) are summarized in Table 1-5.27f. Jacobs resources for completing Title III Engineering (HS3AT) are summarized in Table 1-5.27g. No overtime is planned for this activity.

**TABLE 1-5.27f**  
**TITLE III ENGINEERING RESOURCE SUMMARY – FLUOR FERNALD (HS3AS)**

RESOURCE CODE	FTEs	COMMENTS
ENGCVL	0.5	Site structural engineering support for silo cutting
ENGINR	2.2	Project Engineer (projectized), Project support engineer, technical engineering
TPSREP	1.2	Technical support

**TABLE 1-5.27g**  
**TITLE III ENGINEERING RESOURCE SUMMARY – JACOBS (HS3AT)\***

RESOURCE CODE	FTEs	COMMENTS
TPHO (Jacobs)	7.0	Engineering support of Construction/Operations

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\*Jacobs labor summary is included here for information. The costs of Jacobs labor and ODCs are included as subcontract dollars (Table 1-5.27i) .

### Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Title III Engineering - Fluor Fernald (HS3AS) are identified in Table 1-5.27h. Table 1-5.27i identifies the ODCs for Title III Engineering - Jacobs (HS3AR).

**TABLE 1-5.27h**  
**MATERIALS, ODCS, AND SUBCONTRACTS – TITLE III ENGINEERING (HS3AS)**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	Travel (to Jacobs- Oak Ridge)	\$20,000
Subcontracts	None	---



**TABLE 1-5.27i**  
**SUBCONTRACTS QDCs– TITLE III ENGINEERING (HS3AT)**

R1- F07- 060	ITEM	DESCRIPTION/BASIS	COST
	Subcontracts QDCs	Jacobs (includes labor and travel)	\$1,300,952 <del>\$148,000</del> <del>\$138,000</del>

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059 1.5.3 HS3AC - Construction Management

Construction Management consists of the following key tasks:

- Equipment procurement;
- IFB preparation and award;
- Subcontract management; and
- Construction start-up support.

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025 It is assumed that the construction procedures are maintained under the direction of the functional area manager (FAM) with no major changes planned. The primary procedure for preparing the contract(s) is CT-2.1.1, "Construction Project Planning and Construction Invitation for Bid/Request for Proposal (IFB/RFP) Preparation" (Rev. 11). This procedure will be followed during development of the Preliminary Design Package EDP, as well as during the Pre-bid meeting, and Bid/Contract phase.

It is assumed that the site will have a site welding engineer to maintain the welding procedures, and a site rigging engineer to maintain the hoisting and rigging manual and approve lift-plans.

Using a graded approach, the Silo 3 Project will work from the model contract and make it project-specific. It is also assumed that the model contract Part 8, Health and Safety Requirements, and Part 9, Quality Assurance Requirements (RM-0012), will be maintained by Maintenance and Infrastructure Support. The "Administrative Contractor Requirements" will be maintained by others. Currently there are ACR-001 to ACR-007 which become part of any contract.

Redline/as-built information will be documented by a site surveyor for input into the drawing data-base. Engineering support will be provided for RFIs/DCNs and configuration management, including completion of final drawings to turnover the facility to operations under the Remedial Design charge number.

It is also assumed that the FEMP will need to have a contract for geo-technical/soils testing and weld x-raying.

1) Task #1 - Equipment Procurement

1.1) Plan/Scope - Equipment Procurement

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As part of the Construction Management task, the process equipment will be procured. Labor costs to develop specifications, and issue and award purchase orders are covered under the scope of the Preliminary Design task, as development of specifications is part of the engineering function. Costs of the equipment will be incurred under the construction account, to accurately reflect the cost to construct the Silo 3 remediation facilities. Vendor drawing development and equipment fabrication are considered part of the equipment cost covered by this scope. Vendor purchase orders will contain the HS3AC charge number.

Schedule

Equipment Procurement starts during preliminary design. ~~A hold point has been established prior to the start of long lead procurement, to determine whether to proceed with procurement and the implementation of the remaining project phases, based on the availability of funding. The current baseline assumes that procurement and construction will proceed without delay.~~ Authorization to fabricate is tied to the approval of the PHAR.

1.2) Quantification - Equipment Procurement

Labor Resources

Equipment procurement includes only capital costs. The engineering resources for completing Equipment Procurement are included under the Preliminary and Final Engineering Design phases. The buyer resource is included under both the Preliminary and Final Engineering Design Phases, and IFB Bid Preparation and Award.

Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Equipment Procurement are identified in Table 1-5.28.

**TABLE 1-5.28  
MATERIALS, ODCS, AND SUBCONTRACTS – EQUIPMENT PROCUREMENT**

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ITEM	DESCRIPTION/BASIS	COST
Materials	Major Process Equipment (see Table 1-5.29)	\$3,150,931 <del>\$3,817,931</del>
ODCs	None	---
Subcontracts	None	---

Table 1-5.29 presents the equipment Fluor Fernald will procure for Silo 3 remediation. Fluor Fernald will conduct submittal review and approval and QC inspections for this equipment. Delivery of the equipment will be taken at the FEMP by the appropriate subcontractor.

**TABLE 1-5.29  
 PROCESS EQUIPMENT AND MATERIALS**

ITEM	PRICE/ UNIT	UNITS	ESTIMATED COST	TYPICAL SUPPLIER	NOTES
Treatment Containment Enclosure (60' w x 100' l x 40' h)		1	\$470,000	Universal Fabric Structures	Vendor quote
Interior Wall (100'l x 40'h)		1			
Interior Walls (60'l x 40'h)		1			
Retrieval Containment Enclosure (35' w x 40' l x 30' h)		1			
Retaining Wall (40' l x 5' h)		2	\$100,000		Engineering estimate
Concrete Floor/Foundation with sump		1	\$100,000		Engineering estimate
HVAC Unit/Neg. Air (6,000 cfm)		9	\$192,000	Charcoal Filter Services	Engineering estimate
Stack		1	\$100,000		Engineering estimate
Stack Monitor - Radon		1	\$500,000	Perkin Elmer Instruments	Vendor quote
Stack Monitor - Isokinetic/		1	\$100,000		Engineering estimate
Particulate					
Water Tank (1,000 gal) w/ agitator		3	\$6,600	Chem-Tainer	McMaster- Carr Manual
Water Pump		1	\$1,000		McMaster- Carr Manual
Hosing (tank to mixer)			\$300		Engineering Estimate
Hopper w/ Bag Splitter (Additives)		1	\$20,000		Engineering Estimate
Screw Feeder		1	\$25,000		Engineering Estimate
Chute		1	\$4,700		Engineering Estimate

ITEM	PRICE/ UNIT	UNITS	ESTIMATED COST	TYPICAL SUPPLIER	NOTES
Bin/Hopper (< 10 cy)		1	\$10,000		Engineering Estimate
Load cell		1	\$5,500		Engineering Estimate
Ribbon Mixer (10cy)		1	\$115,000	Bepex	Vendor quote
Push Button Station		1	\$400	Bepex	Vendor quote
Screw Conveyor (40 ft) (Excavator to Hopper)		1	\$8,600		Engineering Estimate
Screw Conveyor (20 ft) (Hopper to Mixer)		1	\$40,000		Engineering Estimate
Screw Feeder (20 ft) (Mixer to Lift Liner)		1	\$17,140	Hawthorne-Seving, Inc.	Vendor quote
Spout/Chute for Filling			\$4,700		Engineering Estimate
Vecloader		1	\$100,000	Vector Technologies, Ltd.	Vendor quote
Front-End Loader		4	\$0	GFE	See Table 1-2.3
Jersey Barriers		14	\$0	GFE	See Table 1-2.3
Soil Feeder		4	\$58,500	J.C. Steele and Sons	Engineering Estimate—IT Corp.
Soil Conveyor System		4	\$75,500	WEBB	Engineering Estimate—IT Corp.
— Includes scale and hopper		4	\$28,000	WEBB	Engineering Estimate—IT Corp.
Drum Shredder		4	\$400,000		Engineering Estimate
— Conveyor					

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ITEM	PRICE/ UNIT	UNITS	ESTIMATED COST	TYPICAL SUPPLIER	NOTES
Shredder Vent Hood		4	\$5,000		Engineering Estimate
Magnetic Separator		4	\$200,000		Engineering Estimate
Sealand Containers	\$15,000/ container	2	\$30,000		Engineering Estimate
Spare Parts (15% major equipment)			\$497,991		
<b>SUBTOTAL</b>			\$2,448,931 <del>\$3,215,931</del>		

ITEM	PRICE/ UNIT	UNITS	ESTIMATED COST	TYPICAL SUPPLIER	NOTES
<b>SUBCONTRACTS FOR MAJOR PROCESS EQUIPMENT</b>					
Water Laser (concrete cutting at Silo 3)		1	\$100,000	The Waterworks	Vendor quote
(concrete cutting at Silo 4)			\$100,000		Additional cost of water laser during mockup
Excavator		1	\$300,000	Cantwell Machinery	Vendor quote
Service Agreement		1			
Modifications – Remote			\$100,000	Hetronics	Vendor quote
Winch (for equip. removal)			\$2,000		McMaster-Carr Manual
Excavator Under-Carriage Hopper/Conveyor			\$100,000	Cantwell Machinery	Vendor quote
<b>SUBTOTAL</b>			\$702,000 <del>\$602,000</del>		
<b>PROCESS EQUIPMENT TOTAL</b>			\$3,150,931 <del>\$3,817,931</del>		

2) Task # 2 - Invitation for Bid Preparation and Award

2.1) Plan/Scope - Invitation for Bid Preparation and Award

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When the Preliminary Design Package ~~EDP~~ reaches preliminary status of completion, construction personnel will begin preparing bid packages for construction subcontractors. It is assumed that the IFBs will be prepared using the nine (9) part model contract pursuant to Fluor Fernald Procedure CT-2.1.1, "Construction Project Planning and Construction Invitation for Bid/Request for Proposal (IFB/RFP) Preparation" (Rev. 11). The IFBs will contain draft SWPs, developed by Fluor Fernald. The final construction estimates will be developed during this stage of the project, as well as the Project Waste Identification and Disposition (PWID) report for waste identification and disposition.

After the required IFBs have been prepared and issued, Fluor Fernald will review and evaluate bidder proposals, resolve bidder comments, and award the contracts. Following contract award, the baseline will be revised.

The final SWPs will be completed by the subcontractor after contract award, describing the work in sufficient detail to provide assurance that the risks associated with the work have been assessed, preventive measures for hazards addressed, and the work has been safely planned in sufficient detail.

It is assumed that IFBs will be prepared for a civil, mechanical, and electrical subcontractors. IFB preparation includes:

- IFB/RFP development
- "Draft Safe Work Plans" for inclusion in IFB/RFP, (Part 8)
- Quality Assurance Requirements and Testing Requirements (Part 9)
- Draft Turnover Plan
- Contractor Submittal Register (Part 6)
- Scope of Work (Part 6)
- Pay-item description
- Certified for Construction (CFC) drawings and specifications (Part 7)

The IFB bid process starts by conducting a pre-bid meeting with subcontractors. The bidding and award phase includes:

- Issue IFB for bids
- Completing government estimate
- Bidder comment resolution
- Bid/proposal review and technical evaluation
- Contract award
- Revise baseline to reflect contract award

Construction will also prepare scopes and requisitions for work/services that are outside the scope in the subcontracts, and will be responsible for preparing the construction schedule and resubmitting work scope/work packages for labor standards determination.

### Schedule

Performance for this activity will be apportioned based on progress against the activities listed in Table 1-5.30. Because these activities will be conducted in parallel, an assigned value of progress will be taken upon completion of each individual activity, until 100% cumulative progress has been taken.

**TABLE 1-5.30  
IFB BID PREPARATION AND AWARD SCHEDULE SUMMARY**

R1- F07- 025	ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
	HS31C1210	Construction IFB Packages through Award (hammock)	117 89	--
	HS3C1312	Initiate – Prepare/Review IFB civil construction subcontract	58 54	7%
		Complete – Prepare/review IFB civil construction subcontract		8%
	HS3C1316	Initiate – Civil bid/award process	35	7%
		Complete – Civil bid/award process		8%
	HS3C1348	Initiate – Prepare/review IFB mechanical construction subcontract	58 54	10%
		Complete – Prepare/review IFB mechanical construction subcontract		10%
	HS3C1352	Initiate – mechanical bid/award process	35	10%
		Complete – mechanical bid/award process		10%
	HS3C1512	Initiate – Prepare/review IFB electrical construction contract	58 54	7%
		Complete – Prepare/review IFB electrical construction contract		8%
	HS3C1516	Initiate – Electrical bid/award process	35	7%
		Complete - electrical bid/award process		8%
			TOTAL	100%

## 2.2) Quantification - Invitation for Bid Preparation and Award

### Labor Resources

The resources for completing the IFB Bid Preparation and Award are summarized in Table 1-5.31. No overtime is planned for this activity.

**TABLE 1-5.31**  
**IFB BID PREPARATION AND AWARD RESOURCE SUMMARY**

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RESOURCE CODE	FTEs	COMMENTS
BUYCON	0.5 <del>1.0</del>	Buyer (projectized) – to develop and issue IFBs)
CNSENG	3.0 <del>2.5</del>	2 projectized construction engineers, one projectized to develop packages
CNSMGR	1.3	<del>Silos Construction Manager (part time) and CCM (projectized)</del>
ENGINR	0.5	Support from model contract lead
FPRENG	0.1	Fire protection input (not projectized)
INDHYG	0.3	Safety review and input (not projectized)
PURMGR	1.0	Purchasing Manager to support issuance and award of IFBs
QACENG	0.5 <del>0.8</del>	QA lead (projectized)
RADENG	0.5	Radiological controls support (not projectized)
S&HENG	0.5	S&H input (not projectized)
TPSMGR	0.5	Safety management input
TPSREP	1.0 <del>0.5</del>	Technical support
WSTENG	0.5 <del>0.3</del>	Waste disposition input
WSTMGR	0.2	<del>Waste disposition input</del>

In addition to these labor resources, which have been included in the Silo 3 baseline, a centralized TPSREP (safety analysis) will be needed to support the development and review of the IFB Packages and ECDC support (E&CTEC) will be needed for document support and filing, but are not included in the baseline.

**Materials, ODCs, and Subcontracts**

The materials, ODCs, and subcontracts for IFB Bid Preparation and Award are identified in Table 1-5.32.

**TABLE 1-5.32**  
**MATERIALS, ODCS, AND SUBCONTRACTS – IFB BID PREPARATION AND AWARD**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	None	---

3) **Task #3 - Subcontract Management**

3.1) **Plan/Scope - Subcontract Management**

Silo 3 Project construction will be integrated with the existing FEMP infrastructure. Coordination planning involves Silos Land Use Allocation Committee, Silos Facility Owner,



Utilities, Engineer, Fire Protection Engineering, and the Advanced Waste Water Treatment Project. Construction is also responsible for interfacing with adjacent projects, including the right-of-way for the AWR project pipe rack.

During construction, Fluor Fernald will perform daily oversight of subcontractors to ensure that the requirements of the contract are being followed in the field, including safety performance, compliance with Remedial Design plans, and verification of installation per approved drawings and specifications. Subcontract management includes:

- Submittal(s) review and approval
- Finalize Safe Work Plans
- Safety Meetings (i.e., Plan of the Day (POD), morning briefings, tool box lunches, afternoon briefings)
- Permits
- Mobilization
- Construction Testing Requirements (QEPs, SIPs)
- Request for Information/Design Change Notices
- Contract Modifications
- Quality assurance (surveillance(s) and assessments)
- Progress reporting (cost and schedule)
- Red-lines and as-built drawings

Fluor Fernald will also prepare scope and requisitions for work/services that are outside of the scope in the subcontracts, including services previously identified as being provided by Fluor Fernald, and is responsible for preparing the construction schedule, QA/QC requirements, developing construction estimate, developing pay item description including breakdown of work items and tasks, sequence of work, scope of work and re-submitting work scope/work package for labor standards determination, and pre-qualification of bidders.

Fluor Fernald will prepare a CAT Plan and procedures, identifying personnel, testing requirements, system boundaries, and standards to be met to ensure that the site preparation activities and the constructed systems meet the design requirements. The CAT will be conducted by the subcontractor to verify their work is in accordance with the requirements of governing codes, industry standards, government regulations and specifications contained within the Preliminary Design Package EDP. Completion of CAT will ensure the facility is installed as designed, red-line information is incorporated into final drawings for operations (as-builts), equipment technical documents are available for maintenance, and close-out the construction phase.

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The roles and responsibilities for Construction Contracts Manager (CCM), Construction Engineer (CE), and Construction Coordinator (CC) are specified in procedure CT-1.3.1, "Construction Functional Area Assigned Reading/Training Program" (Rev. 4).

The CCM is responsible for:

- Monitoring contractor activities;
- Administering the contract;
- Assuring the contractor has provided adequate procedures to comply with site, safety, environmental, quality, and administrative functions, and performs work in a safe and compliant manner;
- Approving the contractor schedule, coordinate inputs with project control;
- Approving contractor pay items, coordinate inputs with project control;
- Ensuring that the contractor takes corrective action in areas that have safety, environmental, quality, progress or work related problems;
- Conducting weekly progress/schedule meetings with the contractor;
- Monitoring construction budget and schedule; and
- Assuring environment provisions of the contract are enforced.

The CE provides technical support to the CCM, as well as:

- Coordinating the resolution of all construction technical or procedural problems with the appropriate design organization for department;
- Assuring the contractor performs the work in accordance with drawings, specifications, plans and procedures; and
- Attending safety briefings and perform job walkdowns.

The CC will:

- Coordinate required Fluor services including, permits, laundry, packaging, other support services;
- Maintain daily log and daily activity reports to record significant events and to provide project history;
- Document progress photos and videos;
- Attend safety briefings and perform job walk-throughs; and

- Coordinate testing and startup services.

Performance against this activity will be apportioned based on subcontractors' pay items schedule and resultant percent complete.

### 3.1)1 Subtask #1 - Construction Safe Work Plans

Construction safe work plans will be developed, describing the work to be performed in sufficient detail to ensure that the risks associated with the work have been assessed and preventive measures for the hazards addressed. The risks, hazards, and mitigators will be identified in the Project-Specific Health and Safety Requirements Matrix. Construction safe work plans will be used to brief the workers and ensure that they clearly understand the planned activities.

To ensure clear communication and expectations with the contractor, draft Safe Work Plans with minimum requirements will be developed by Fluor Fernald and included as attachments to the IFB/RFP. The contractor will be expected to provide additional detail, for each task, after award of the contract, for final approval of the Safe Work Plan(s). The Safe Work Plan is intended to be a briefing document that has incorporated the guiding principles and core functions of Integrated Safety Management systems.

Safe Work Plans will be developed for the following tasks:

- Mobilization (receipt of materials, equipment deliveries and inspections);
- Miscellaneous excavation activities, (foundation and underground activities, gravel placement) including erosion controls;
- Concrete work (formwork, placement, and cutting)
- Steel work (including re-steel);
- Containment (tension support structure) erection;
- Miscellaneous containment construction (interior work);
- Equipment setting
- Piping installation (underground, overhead, and ductwork), including Energy Isolations Plans (EIPs);
- Electrical Work (lock and tag), including EIPs;
- Trailer Installation;
- Breaching the silo;
- Decontamination of tools and equipment.

The Safe Work Plan will be developed in accordance with ACR-002, "Contractor Safe Work Plan Format Requirements" (Rev. 4).

### 3.1)2 Subtask #2 - Safety and Health Oversight

Permits will be issued by Fluor Fernald after approval of a Safe Work Plan. Permits include: Work permits; Radiological, Penetration; Service Interruption; Energy isolation plans; Open Flame and Welding; Confined Space Evaluation; Chemical Hazardous Material; Silo Dome Access; and Scaffold Inspection Checklist/Access. Fluor Fernald shall provide 100% oversight during penetration/excavation activities and lock and tag activities.

Fluor Fernald will provide any monitoring required for heat and cold stress, radiological surveys and monitoring and launderable PPE.

The analyses identified in Table 1-5.33 are assumed for industrial hygiene requirements during Silo 3 Construction. It is assumed that equipment must be purchased for this project and that samples will be analyzed using on-site personnel.

**TABLE 1-5.33  
ESTIMATED IH SAMPLE ANALYSES**

ANALYSIS	QUANTITY
Metals (Fumes/Particulates)	10
Organics	10
Particulates (Nuisance)	20
Silica	30
<b>TOTAL</b>	<b>70</b>

### 3.1)3 Subtask #3 - Field Quality Control Oversight

Programmatically, the guidance for QC will be RM-0012, "Quality Assurance Program." This program will be applied to each SSC using a graded approach. The quality level for each SSC will be based on the performance grade of the SSC.

Vendor Shop - QA/QC will perform vendor shop surveillances, and source inspections per Fluor Fernald procedures.

Field CAT - The design specification sections provide guidance in establishing minimum field verification activities. These may be in the form of submittals, transmittals, inspections and/or surveillances. Quality Levels will have been specified during the design phase. QC engineers will review design drawings and specifications and identify any quality "hold-points" for the contractor. Quality Evaluation Plans (QEPs) will be written for these "hold points". Construction acceptance testing will be performed by the contractor representative with verification and approval by Fluor Fernald.

QC may require additional sub-contractor support for geo-technical and concrete testing. It is assumed that specifications will be written to require welding inspections at the vendor shop. The QC representative is responsible for performing any quality walkdowns,

documenting the results, and processing any identified deviations in accordance with the site non-conformance procedure. The QC representative may inspect and/or accept any portion of the work at any time desired. Final quality inspections, including any integrated testing, will be coordinated with the contractor and construction management.

#### 3.1)4 Subtask #4 – Mock-up of Silo Entry

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Prior to cutting of Silo 3 for material retrieval, a mock-up of the Silo 3 cutting design will be performed on Silo 4 by the specialty subcontractor hired to cut Silo 3. This mock-up is being conducted in order to demonstrate the cutting design and technology chosen for accessing Silo 3. This mock-up will enable craftsman to practice the required cutting and accessing procedures on an empty silo, prior to conducting this work on Silo 3, where material is present in the silo during the cutting operation and contamination control measures will be required.

#### Accessing the Silo

The design specified for accessing the silo will be duplicated on Silo 4. However, the containment adjacent to the silo will not be required for the Silo 4 mock-up. The assumed design for accessing Silo 3 is described in Section 1.5.6 under Task 1, Subtask 1 "Retrieval". The same vendor and equipment required for the Silo 3 design will be used for the Silo 4 mock-up.

The work plan developed for accessing Silo 3 would be modified to remove the contamination controls required, as Silo 4 contains no radiological materials. However, any PPE required for conducting the cut on Silo 3 would be required for the mock-up on Silo 4, so that personnel may become accustomed to the conditions in which they will be required to work on Silo 3.

#### Schedule

The Subcontract Management activity begins with the award of the first subcontract. This activity continues until construction turnover to operations and the mockup on Silo 4 is complete. Progress against the activity will be apportioned against the subcontract activity, ~~ORR and silo cutting~~.

#### 3.2) Quantification – Subcontract Management

#### Labor Resources

The resources for completing Subcontract Management are summarized in Table 1-5.34:

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**TABLE 1-5.34  
SUBCONTRACT MANAGEMENT RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
BUYCON	0.5 <del>1.5</del>	<del>One projectized and one non-projectized</del> buyer to administer subcontracts and purchase materials.
CNSCOD	1.0	Coordinator (projectized) – obtain permits
CNSENG	4.0 <del>3.0</del>	Construction support (projectized)
CNSMGR	0.2 <del>1.3</del>	<del>Projectized CCM and</del> part-time support of Silos Division CM
DEPADM	0.2	Administration of management programs for Silos Division Construction
ENGINR	0.5	Support from model contract organization
ENSTEC	0.1	Lab support
FPRENG	0.1	Fire protection oversight of construction
INDHYG	0.2 <del>0.15</del>	IH engineering (not projectized)
LABCHM	0.5	Process samples
PURMGR	1.0	Purchasing Manager to support subcontracts and purchasing of materials.
QACENG	1.3 <del>2.0</del>	Projectized QA lead, QC inspector
QACTEC	1.0	QA/QC support
RADENG	0.4 <del>0.5</del>	Radiological engineering support (not projectized)
RADTEC	2.0 <del>1.0</del>	Radiological technical support (not projectized)
S&HENG	0.8	S&H field oversight (not projectized)
TPSMGR	0.5	<del>Safety and Health Management support (non-projectized)</del>
TPSREP	1.0 <del>0.5</del>	Technical support for subcontract management
WSTENG	1.0 <del>0.3</del>	Support waste management activities
<del>WSTMGR</del>	<del>1.0</del>	<del>Lead waste management activities during construction</del>

During the Subcontract Management subtask, overtime will be incurred; however, the individual resources requiring overtime will vary. Overtime is estimated to be 25%. Table 1-5.35 indicates an estimate, in manhours, for 25% overtime:

**TABLE 1-5.35  
SUBCONTRACT MANAGEMENT OVERTIME SUMMARY**

RESOURCE CODE	FTEs	REGULAR HOURS	OVERTIME HOURS	TOTAL MAN-HOURS
CNSMGR	1.3	1383	346	1729
TPSREP	0.5	532	133	665
TPSMGR	0.5	532	133	665
CNSENG	3.0	3193	799	3992
CNSCOD	1.0	1065	266	1331
QACENG	2.0	2129	532	2661
ENGINR	0.5	532	133	665
S&HENG	0.8	852	213	1065

RESOURCE CODE	FTEs	REGULAR HOURS	OVERTIME HOURS	TOTAL MAN-HOURS
RADENG	0.5	532	133	665
INDHYG	0.16	160	40	200
RADTEC	1.0	1065	266	1331
WSTMGR	1.0	1065	266	1331
WSTENG	0.3	319	80	399
FPRENG	0.1	106	27	133
BUYCON	1.5	1597	399	1996
LABCHM	0.5	532	133	665
ENSTEC	0.1	106	27	133
<b>TOTAL MAN-HOURS</b>		<b>16232</b>	<b>4059</b>	<b>20291</b>

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RESOURCE CODE	FTEs	REGULAR HOURS	OVERTIME HOURS	TOTAL MAN-HOURS
BUYCON	0.5	773	193	966
CNSCOD	1.0	1546	386	1932
CNSENG	4.0	6182	1546	7728
CNSMGR	0.2	309	77	386
DEPADM	0.2	309	77	386
ENGINR	0.5	773	193	966
ENSTEC	0.1	155	39	194
FPRENG	0.1	155	39	194
INDHYG	0.2	309	77	386
LABCHM	0.5	773	193	966
PURMGR	1.0	1546	386	1932
QACENG	1.3	2009	502	2511
QACTEC	1.0	1546	386	1932
RADENG	0.4	618	155	773
RADTEC	2.0	3091	773	3864
S&HENG	0.8	1236	309	1545
TPSREP	1.0	1546	386	1932
WSTENG	1.0	1546	386	1932
<b>TOTAL MAN-HOURS</b>		<b>24422</b>	<b>6101</b>	<b>30525</b>

In addition to these labor resources, which have been included in the Silo 3 baseline, centralized safety analysis support will be needed to support subcontract management and ECDC support will be needed for document support and filing, but are not included in the baseline.

#### Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Subcontract Management are identified in Table 1-5.36.

**TABLE 1-5.36**  
**MATERIALS, ODCS, AND SUBCONTRACTS – SUBCONTRACT MANAGEMENT**

ITEM	DESCRIPTION/BASIS	COST
Materials	PPE for personnel (hard hats, glasses), barricades, signs	\$10,000
ODCs	Travel (equipment supplier inspections)	\$20,000
Subcontracts	Geotechnical and concrete testing	\$10,000

4) Task #4 - Construction Start-up Support

4.1) Plan/Scope - Construction Start-up Support

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This scope of work involves construction support during system operability testing (SOTs), the ~~Fissile Compounds Standard Startup Review (SSR)~~ and the Silo 3 Operational Readiness Review (ORR). In addition, work plans will be developed for cutting open the silo and contractor oversight performed for the cutting of the silo after the ORR.

Schedule

The Construction Startup subtask begins at the completion of subcontract fieldwork and ends with the completion of Title III Engineering.

4.2) Quantification - Construction Start-up Support

Labor Resources

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The resources for completing Construction Startup Support are summarized in Table 1-5.37. No overtime is planned for this activity.

**TABLE 1-5.37**  
**CONSTRUCTION STARTUP SUPPORT RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
BUYCON	0.5	Buyer support
CNSEN	3.0 <del>1.0</del>	Construction support (projectized)
CNSMGR	1.3	<del>Projectized CCM and P/T support of Silos Division CM</del>
TPSREP	1.0	Technical support

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During the Construction Startup subtask, overtime will be incurred. Overtime is estimated to be 25%. Table 1-5.37a indicates an estimate, in manhours, for 25% overtime:



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**TABLE 1-5.37a**  
**CONSTRUCTION STARTUP SUPPORT OVERTIME SUMMARY**

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RESOURCE CODE	FTEs	REGULAR HOURS	OVERTIME HOURS	TOTAL MAN-HOURS
BUYCON	0.5	487	122	609
CNSENG	3.0	2922	704	3626
TPSREP	1.0	974	244	1218
<b>TOTAL MAN-HOURS</b>		<b>4383</b>	<b>1070</b>	<b>5453</b>

Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Construction Startup Support are identified in Table 1-5.38.

**TABLE 1-5.38**  
**MATERIALS, ODCS, AND SUBCONTRACTS – CONSTRUCTION STARTUP SUPPORT**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	None	---

**1.5.4 HS3AD - Subcontracts**

**1) Plan/Scope – Subcontracts**

Silo 3 construction will be performed by subcontractors using GCBCTC labor in accordance with the PLA. Construction contracts will be awarded for a defined scope of work. The primary procedure for preparing the contract(s) is CT-2.1.1, "Construction Project Planning and Construction Invitation for Bid/Request for Proposal (IFB/RFP) Preparation" (Rev. 11). This procedure will be followed during development of the Preliminary Design Package EDP, as well as during the Pre-bid meeting, and Bid/Contract phase. Three contracts are anticipated being written: Installation of civil and structural work, including erection of containment facility; Mechanical work, including equipment setting and piping; and Electrical and Instrumentation work. Long-lead procurement will be by Fluor Fernald and start during the remedial design phase with delivery scheduled for receipt by the contractor. The long-lead procurement is expected to be limited to major equipment. The contractors will be responsible for providing all other material and equipment.

During the planning phase each scope of work will be advertised in the Commerce Business Daily to obtain the best possible bidders list, unless an adequate list of interested, qualified bidders already exists. If necessary, new contractors will be pre-

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qualified prior to bidding. During bid and award the contractors will be evaluated against technical, safety, and pricing requirements, if identified as criteria for award.

The contractor will finalize the Safe Work Plans for approval by Fluor Fernald. Fluor Fernald safety representatives will have an active role in ensuring that the site's safety objectives are met in the field. The subcontractor will have at least one safety officers/representatives full-time on the job. The contractor will have minimum of two daily safety briefings. The contractor will be required to have trained and competent personnel as identified by OSHA and the Health and Safety requirements of the scope of work. The contractor will also have qualified riggers, trained to site requirements, and develop all rigging plans for approval by Fluor.

The contractor will perform construction acceptance testing in accordance with the requirements in the technical drawings and specifications. Hold points will be indicated in the specifications. The QEPs will be developed directly from the project drawings and specifications. Any code or procedure compliance requirements will be defined in the technical documents.

Contractor performance will be monitored against safety, quality, cost, and schedule performance. The contractor will be required to prioritize his work in accordance with the turnover plan and schedule.

Contractor performance will be measured against the pay items schedule contained in the subcontract.

#### 1.1) Task #1 - Civil Contractor Fieldwork

The scope of the civil subcontract consists of those activities necessary to support the selection of a subcontractor to perform civil work for the Silo 3 Project. In addition, the scope consists of activities to ensure proper oversight of civil work. The civil scope includes underground utilities (except electrical); excavation; sub-base preparation; concrete work, such as foundations and walls; erection of the containment structures and interior partitions; and installation of any support trailers.

#### 1.2) Task #2 - Mechanical Contractor Fieldwork

The scope of the mechanical subcontract consists of those activities necessary to support selection of a subcontractor to perform mechanical work for the Silo 3 Project. In addition, the scope consists of activities to ensure proper oversight of mechanical work. This scope of work includes receipt and handling of any Fluor Fernald-supplied equipment. The mechanical scope includes labor, materials, and miscellaneous equipment for piping, equipment setting and ductwork.

1.3) Task #3 - Electrical Contractor Fieldwork

The scope of the electrical subcontract consists of those activities necessary to support selection of a subcontractor to perform electrical work for the Silo 3 Project. In addition, the scope consists of activities to ensure proper oversight of electrical work. This electrical scope of work includes labor and materials for underground and overhead electrical power, motor control center (MCC), power and lighting panels, cable tray, conduit, lighting fixtures, control panels, CCTV (if not provided by the equipment vendor) and instrumentation.

Schedule

The Subcontract subtask begins with the completion of the IFB Bid and Award Process and ends prior to the start of Construction Startup Support.

2) Quantification – Subcontracts

Labor Resources

The resources for completing the Subcontracts are summarized in Table 1-5.39:

**TABLE 1-5.39  
 SUBCONTRACTS RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
SUBCONTRACTOR CRAFT	26.0	Paid by subcontractor, however, access training and medical provided by Fluor Fernald.
SUBCONTRACTOR STAFF	4.0	Paid by subcontractor, however, access training and medical provided by Fluor Fernald.

Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Subcontracts are identified in Table 1-5.40.

**TABLE 1-5.40  
 MATERIALS, ODCS, AND SUBCONTRACTS – SUBCONTRACTS**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	Civil, Mechanical and Electrical Subcontracts [includes labor (Table 1-5.39) and equipment provided by the subcontractor (Table 1-5.41)]	\$6,953,6003,513,664

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Table 1-5.41 identifies the equipment and materials the subcontractors will supply as part of their contract with Fluor Fernald:

**TABLE 1-5.41  
SUBCONTRACTOR PROVIDED EQUIPMENT**

	ITEM	PRICE/ UNIT	UNITS	ESTIMATED COST	TYPICAL SUPPLIER	NOTES
	Sump Pump		2	\$1,600		Engineering Estimate
RI-F07-028	Silo Reinforcing bands for Silo 3			\$100,000		Engineering Estimate
	Silo Reinforcing bands for Mock-up of Silo Entry on Silo 4			\$100,000		Engineering Estimate
	Crane Pad		1	\$200,000		Engineering Estimate
R1-D-473	Control Trailer		1	\$200,000		Engineering Estimate
	<del>Change-out Trailer</del>		4	<del>\$200,000</del>		<del>Engineering Estimate</del>
	Piping/Ductwork			\$200,000		Engineering Estimate
	Electrical & Communication			\$500,000		Engineering Estimate
	Lights			\$200,000		Engineering Estimate
R1-D-480	Closed Circuit Cameras		9	\$35,070	Technical Images	Vendor quote - Includes cost of entire CCTV System
	Instrumentation 10% of [total process equipment (Table 1-5.29) minus cost of spare parts]			\$331,994		\$432,953
	<b>TOTAL</b>			<b>\$1,868,664</b>	<b>\$1,968,664</b>	

#### 1.5.5 HS3AE - Startup/Startup Review

This scope of work includes:

- Start-up management;
- Operating Procedures development;
- Final Hazard Analysis Report (FHAR) development;
- Maintenance Plan development
- Training development;
- Conducting training;
- Develop System Operability Testing (SOT) Procedures;
- Conducting SOTs;
- ~~Fissile Compounds Standard Startup Review;~~
- ~~Fissile Compounds Operations;~~
- ~~Preparing for Silo 3 Operations; and~~
- Operational Readiness Review (ORR).

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#### 1) Task #1 - Start-Up Management

##### 1.1) Plan/Scope - Start-Up Management

Start up management includes the oversight and overall planning for startup activities, as well as the management activities to ensure that the project is ready for operations, such as preparing project files for start-up review, conducting self-assessments, and developing conduct of operations (CONOPs). Fluor Fernald will prepare a CONOPs applicability matrix to define the extent to which CONOPs guidelines will be applied.

CONOPs documents the activities in the following key areas integral to operations: operations organization and administration, operating practices and shift routines, control area activities, communications, on-shift training, investigation of off-normal events, notifications, control of equipment and system status, lockout/tagout, independent verification, log keeping, shift turnover, required reading, orders to operators, operational procedures, operator aids, and equipment and piping labeling. Standing orders will be prepared to implement these CONOPs requirements.

Start-up management also includes management activities to ensure that the project is ready for operations, such as preparing project files for start-up review and conducting self-assessments. The type of readiness review required for this project will be determined based on the approved hazard category. Fluor Fernald will develop a readiness plan for the Silo 3 Project. The Fluor Fernald Silo 3 Project Team and or/Fluor Fernald Readiness Team will then develop and implement a Readiness Plan of Action (POA) and a Readiness Implementation Plan (RIP), as appropriate.

Start-up management also includes procurement of supplies and material that will be necessary to support startup and operations. This supplies and materials are listed in Tables 1-5.44 and 1-5.45.

### Schedule

Start-up Management is scheduled to begin with the start of Operating Procedures and ends with the completion of the DOE ORR. Performance against the Start-up Management activity will be apportioned based on progress against the other activities in the charge account.

### 1.2) Quantification - Start-Up Management

### Labor Resources

The resources for completing Start-up Management activity are summarized in Table 1-5.42. No overtime is planned for this activity.

**TABLE 1-5.42  
 START-UP MANAGEMENT RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
BUYCON	0.5	Purchase operations start-up materials (not projectized)
DEPADM	1.0	Manage files and documentation for ORR (projectized)
ENGINR	1.0	CONOPs engineer — develop readiness documentation
ENGMEC	0.8	Engineering support
FPRENG	0.2	Fire protection support
OPRMGR	1.0	Support from division operations management (not projectized)
PJSREP	0.6	Operations support, Maintenance Engineer,
PRJMGR	0.3	Support of Silos Division Operations Manager (not projectized)

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In addition to these labor resources, which have been included in the Silo 3 baseline, centralized ECDC resources will be needed to support project documentation development and filing, but are not included in the baseline.

### Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Start-up Management are identified in Table 1-5.43.

**TABLE 1-5.43**  
**MATERIALS, ODCS, AND SUBCONTRACTS – START-UP MANAGEMENT**

R1- F07- 028	ITEM	DESCRIPTION/BASIS	COST
	Materials	Initial Operations Equipment (see Table 1-5.44)	\$735,650
		PPE (see Table 1-5.45)	\$27,098 <del>\$31,850</del>
	ODCs	None	---
	Subcontracts	Coleman (CONOPs/Readiness Support) None	\$179,764 —

Table 1-5.44 provides the anticipated equipment to be procured by Fluor Fernald for industrial hygiene, radiological control, startup and start of operations.

**TABLE 1-5.44**  
**INITIAL OPERATIONS EQUIPMENT**

ITEM	PRICE/ UNIT	UNITS	ESTIMATED COST	TYPICAL SUPPLIER	NOTES
Local Vacuum (HEPA)		1	\$50,000		Engineering Estimate
Breathing Air System (equipment & hoses)			\$110,000	Air Systems International	Includes entire Breathing Air System (68 scfm trailer). Vendor quote for trailer only - \$62,950
<b>Radiological Monitoring Equipment</b>					
Gooseneck Air Samplers		10	\$15,000		S&H Eng. Estimate
Tennelec		2	\$90,000		S&H Eng. Estimate
Alpha Cam		2	\$25,000		S&H Eng. Estimate
SACs		2	\$2,100		S&H Eng. Estimate
ASP-23 w/ alpha probe		2	\$7,500		S&H Eng. Estimate
PCM-2		1	\$45,000		S&H Eng. Estimate
Micro-R Meter		1	\$850		S&H Eng. Estimate

ITEM	PRICE/ UNIT	UNITS	ESTIMATED COST	TYPICAL SUPPLIER	NOTES
Pylon		1	\$8,500		S&H Eng. Estimate
Breathing Zone Monitors (BZs)		5	\$3,000		S&H Eng. Estimate
Environmental Boundary Samplers		4	\$11,500		S&H Eng. Estimate
Hi-Volume Samplers		4	\$0	GFE	See Table 1-2.3
IH Equipment					
224-PCXR8 Air Check Sampler		5	\$3,500		S&H Eng. Estimate
Air Check Sampler Charger		1	\$600		S&H Eng. Estimate
PDR-1200 Real-Time Aerosol Monitor		1	\$4,400		S&H Eng. Estimate
TMX 412 Multi-Gas Monitor		1	\$2,500		S&H Eng. Estimate
dB-3080 Noise Monitor		2	\$3,500		S&H Eng. Estimate
2800 Sound Level Meter		1	\$2,000		S&H Eng. Estimate
Quest Temp 30		1	\$1,100		S&H Eng. Estimate
CMS Analyzer		1	\$1,100		S&H Eng. Estimate
T-82 Single Gas Monitor		1	\$800		S&H Eng. Estimate
Equipment Repairs/Supplies			\$1,000		S&H Eng. Estimate
Equipment Calibration			\$1,500		S&H Eng. Estimate
Calibration Gas			\$1,000		S&H Eng. Estimate
Sample Media			\$500		S&H Eng. Estimate
Analytical			\$50,000		S&H Eng. Estimate
Eyewash		1	\$300		McMaster-Carr Manual
Safety Shower		1	\$200		McMaster-Carr Manual



ITEM	PRICE/ UNIT	UNITS	ESTIMATED COST	TYPICAL SUPPLIER	NOTES
Radiant Heaters	\$200/unit	10	\$2,000		McMaster-Carr Manual
Fork Truck		1	\$0	GFE	See Table 1-2.3
A-frame Hoist (2 ton)		1	\$5,000		Engineering Estimate
Lift Liner Loading Frame	\$200/ frame per month	3	\$1,800	Transport Plastics	Vendor quote - 3 months of rental
Lift Liner Lifting Frame	\$5200/ frame	2	\$10,400	Transport Plastics	Vendor quote
Flatbed Trailers		8	\$0	GFE	See Table 1-2.3
Crane		1	\$0	GFE	See Table 1-2.3
Dynalink Crane Scale		1	\$0	GFE	See Table 1-2.3
Yard Tractor		1	\$0	GFE	See Table 1-2.3
Spray Equipment (decon)			\$100,000		Engineering Estimate
Rigging Shackles/Chokers for concrete removal			\$0	GFE	See Table 1-2.3
Supersaks	\$500/ bag	350	\$175,000	Transport Plastics	Vendor quote
Inner Liners					
<b>TOTAL</b>			<b>\$735,650</b>		

Table 1-5.45 provides the anticipated personal protective equipment (PPE) to be procured by Fluor Fernald for startup and start of operations.

**TABLE 1-5.45  
INITIAL PERSONAL PROTECTIVE EQUIPMENT**

ITEM	PRICE/ UNIT	UNITS	ESTIMATED COST	TYPICAL SUPPLIER	NOTES
<b>Powered Air Purifying Respirators (PAPRs)</b>					
PAPRs with belt	\$500/ unit	18	\$9,000	3M	ARAMSCO Pricing Manual, 1 PAPR per occupant
Battery Packs	\$175/ each	18	\$3,150		ARAMSCO Pricing Manual
Battery Chargers	\$60/each	18	\$1080		ARAMSCO Pricing Manual
HEPA Filters (Model P-100) – (Silo 3 Operations)	\$6/filter	4140	\$24,840		ARAMSCO Pricing Manual 18 filters/day @ 230 days
<del>HEPA Filters (Model P-100) – (Fissile Compounds Operations)</del>	<del>\$6/filter</del>	<del>792</del>	<del>\$4,752</del>		<del>ARAMSCO Pricing Manual 18 filters/day @ 44 days</del>
<b>Bubble Suits (Silo 3 Operations only)</b>					
Bubble Suit	\$42/suit	100	\$4,200		ARAMSCO Pricing Manual, 8 individuals per month for 12 months
Bubble Suit Hood	\$65/hood	100	\$6,500		ARAMSCO Pricing Manual
<b>TOTAL</b>			<b>\$27,098</b>	<b>\$31,850</b>	

Tyveks and rubber booties required for startup activities will be obtained from the FEMP supply. The requirements for these items are specified in Section 1.2.3 as GFE.

## 2) Task #2 - Operating Procedures

### 2.1) Plan/Scope - Operating Procedures

Operating procedures will be developed by Fluor Fernald to direct personnel in the safe operation of the Silo 3 treatment systems and equipment during normal, off-normal, and emergency conditions. Existing Fluor Fernald operating procedures will be used by the Fluor Fernald labor force in performing routine Hazardous Waste Material Transportation

Technician (HAZMAT) and Hazardous Waste Technician (HAZWAT) operations. It is assumed that operating procedures will be developed for the following Silo 3 activities:

- Operation of the Excavator;
- Operation of the Vecloader;
- Operation of the HEPA ventilation system;
- Operation of Mixing System/Conveyors/Additive system;
- Operation of Breathing Air System;
- Operation of CCTV system;
- Loading of Lift Liners™ (setting in frames, inspection, filling, closing);
- Transport of materials to rail facility;
- Movement of gondola car on Silo 3 track;
- Emergency Operating Procedure;
- System Shut-down (short-duration); and
- Decontamination (including tools and equipment).

An approved lift plan for placing Lift Liners™ into gondola cars will also be prepared.

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~~The following additional procedures will be prepared in support of Fissile Compounds Operations:~~

- ~~• Loading and Operation of Shredder;~~
- ~~• Operation of Magnetic Separator;~~
- ~~• Mixer Clean-out; and~~
- ~~• Metal Loading into Trucks.~~

### Schedule

Operating procedures will be drafted and reviewed prior to the start of SOTs. However, procedures will not be finalized until SOTs have been completed, and lessons learned from the system operability testing can be incorporated into the procedures. The schedule for preparation of the operating procedures is summarized by the activities in Table 1-5.46. All activities are assumed to have a "finish to start" relationship. Progress on the key activities will be tracked and reported based upon the designated milestones identified with the completion of the respective activity.

**TABLE 1-5.46  
 OPERATING PROCEDURES SCHEDULE SUMMARY**

R1-F07-028	ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
	HS3E0210	Operating Procedures (Hammock)	76	--
	HS3E0214	Prepare Operating Procedures (12 46 total)	48	5% per procedure drafted (60% 80% max)
	H23E0216	Fluor Fernald Review and Comment	12	--
	HE3E0218	Incorporate Comments and Revise	12	--
	HS3E0222	Approve Operating Procedures	4	1% per procedure (12% max)
	---	All 16 Procedures Approved	--	100% total

2.2) Quantification - Operating Procedures

Labor Resources

The resources for completing Operating Procedures are summarized in Table 1-5.47. No overtime is planned for this activity.

**TABLE 1-5.47  
 OPERATING PROCEDURES RESOURCE SUMMARY**

R1-F07-025	RESOURCE CODE	FTEs	COMMENTS
	CHMOPR	0.5	Operator input to procedure development
	ENGPRC	1.3	System Engineer, Procedure Writer
	ENSREP	0.2	Rail operations management input
	HEOOPR	0.5	Heavy Equipment Operator input to procedure development
	TPHO	0.5	Systems Engineering Input (Jacobs)
	MILWRT	0.5	Millwright input to procedure development
	OPRMGR	1.0 0.8	Operations management support, Rail operations management input
	PJSREP	1.0	Maintenance management support
	QACENG	0.2	QA input
	RADENG	0.5 0.4	Radiological controls input
	S&HENG	0.1	Safety input
	TECWRT	0.5 1.0	Procedures Group support
	TPSREP	1.0	Writing procedures
	WTENG	0.7 0.2	Rail operations engineering input, input on waste shipping/disposal issues

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RESOURCE CODE	FTEs	COMMENTS
WSTMGR	0.5	WAO input

Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Operating Procedures are identified in Table 1-5.48.

**TABLE 1-5.48**  
**MATERIALS, ODCS, AND SUBCONTRACTS – OPERATING PROCEDURES**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	None	---

3) Task #3 - Final Hazard Analysis Report

3.1) Plan/Scope - Final Hazard Analysis Report

Fluor Fernald will continue with the preparation of the Final Hazard Analysis Report (FHAR) in parallel with construction. The FHAR will be prepared using the guidelines of DOE-STD-3009-94. A FHAR is required for DOE authorization to operate the Silo 3 facility and follows the final design package. The FHAR will be updated to be consistent with design changes and as-built conditions. The FHAR will be developed prior to operation of the remediation facility and will identify hazards, describe and analyze the adequacy of measures taken to eliminate, control, or mitigate these hazards, and analyze and evaluate potential accidents and associated risks. The FHAR will be supported by the following structured evaluations and analyses using engineering design information from the evolving Final Engineering Design Package: Hazard Category Calculations (HCCs), Accident Analysis, As Low As Reasonably Achievable (ALARA) Analysis, Integrated Hazard Analysis (IHA), Fire Hazard Analysis (FHA), and Human Factors Evaluation (HFE).

Schedule

The schedule for the FHAR and its supporting documentation is summarized by activity in Table 1-5.49. Incremental progress on the support documentation components will be difficult to quantify based upon the evolution of the engineering and design effort. This documentation is prepared in parallel and can effect each other significantly. Therefore, for reporting purposes progress on the key activities will be tracked and reported based upon the designated milestones identified with the completion of the respective activity. Milestone percentages shown are cumulative.

**TABLE 1-5.49**  
**FINAL HAZARD ANALYSIS REPORT SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
Safety Basis Support Documentation			
HS3E4400	Final HCCs		--
HS3E4410	Final Accident Analysis		--
HS3E4420	Final ALARA Analysis		--
HS3E4430	Final IHA		--
HS3E4440	Final FHA		--
HS3E4450	Final HFE		--
Safety Basis Document			
HS3E4110	Final Hazard Analysis Report (Hammock)	163 <del>162</del>	--
HS3E4120	Initiate preparation of Silo3 draft FHAR	40	10%
	Complete- Prepare Draft FHAR		40%
HS3E4130	Fluor Fernald Review/Revise Draft FHAR and Comment	14	45%
HS3E4140	DOE Review Draft FHAR	14	50%
HS3E4150	Incorporate Comments and Revise FHAR	9	60%
HS3E4160	ISRC Review FHAR	18	65%-
HS3E4170	Incorporate ISRC Comments and Revise FHAR	9	70%
HS3E4190	Fluor Fernald, Inc. Accepts FHAR	9	75%
HS3E4200	DOE Review FHAR	25	80%
HS3E4220	Incorporate DOE Comments and Revise FHAR	18	90%
HS3E4230	DOE Approves FHAR	11	--
HS3E4240	DOE Issues FHAR SER	0	100%

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### 3.2) Quantification - Final Hazard Analysis Report

#### Labor Resources

The resources for completing the Final Hazard Analysis Report are summarized in Table 1-5.50. No overtime is planned for this activity.

**TABLE 1-5.50**  
**FINAL HAZARD ANALYSIS REPORT RESOURCE SUMMARY**

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RESOURCE CODE	FTEs	COMMENTS
FPRENG	0.1	FHA development input
INDHYG	0.3 <del>0.15</del>	IHA development input
<del>PJSREP</del>	<del>0.3</del>	<del>Technical support for IHA</del>
RADENG	0.6 <del>1.5</del>	ALARA Analysis development input
<del>TPSMGR</del>	<del>0.3</del>	<del>H&amp;S management support (not projectized)</del>
TPSREP	1.0	Technical support for plan development

In addition to these labor resources, which have been included in the Silo 3 baseline, there are several centralized resources, which are needed to support the development and review of the FHAR, but are not included in the baseline. These include safety analysis personnel and management, human factors engineering personnel and ALARA committee members.

Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Final Hazard Analysis Report are identified in Table 1-5.51.

**TABLE 1-5.51**  
**MATERIALS, ODCS, AND SUBCONTRACTS – FINAL HAZARD ANALYSIS REPORT**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	None	---

4) Task #4 - Maintenance Plan

4.1) Plan/Scope - Maintenance Plan

A Maintenance Plan will be prepared to document the maintenance strategy and maintenance requirements during operations. The Maintenance Plan will determine what maintenance work orders, procedures, or other documentation will need to be prepared to support maintenance activities. These documents will be prepared prior to initiating operations, where appropriate.

Schedule

The schedule for preparation of the Maintenance Plan is summarized by the activities in Table 1-5.52. All activities are assumed to have a "finish to start" relationship. Progress

on the key activities will be tracked and reported based upon the designated milestones identified with the completion of the respective activity.

**TABLE 1-5.52  
 MAINTENANCE PLAN SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HS3E0240	Maintenance Plan (Hammock)	76	--
HS3E0244	Initiate – Prepare Maintenance Plan	48	20%
	Complete – Prepare Maintenance Plan		60%
HS3E0246	Fluor Fernald Review and Comment	12	80%
HS3E0248	Incorporate Comments and Revise	12	90%
HS3E0252	Approve Maintenance Plan	4	100%

#### 4.2) Quantification - Maintenance Plan

##### Labor Resources

The resources for completing the Maintenance Plan are summarized in Table 1-5.53. No overtime is planned for this activity.

**TABLE 1-5.53  
 MAINTENANCE PLAN RESOURCE SUMMARY**

R1-  
F07-  
025

RESOURCE CODE	FTEs	COMMENTS
ENGPRC	0.2	<del>Systems engineering support of plan development</del>
TPHO	0.5	Systems Engineering support (Jacobs)
MNTMGR	1.0	Maintenance Supervisor
MNTREP	1.0 <del>0.5</del>	Develop maintenance work orders based on plan
QACENG	0.5	QA input to plan
RADENG	0.4	<del>Radiological control input to plan</del>
S&HENG	0.1	Safety input to plan
TECWRT	0.5 <del>1.0</del>	Procedure Writer
WSTENG	0.2	Waste management input to plan

##### Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for the Maintenance Plan are identified in Table 1-5.54.



**TABLE 1-5.54**  
**MATERIALS, ODCS, AND SUBCONTRACTS – MAINTENANCE PLAN**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	None	---

5) Task #5 - Develop Pre-operations Training

5.1) Plan/Scope - Develop Pre-operations Training

R1-  
F07-  
034

~~The~~ A Silo 3 – Specific Training and Qualification Plan (T&QP) will be prepared for the Silo 3 Project ~~will be updated~~ to reflect the project-specific training that will be required for operators, supervisors, and support personnel who will be implementing the remedial action. Based on ~~the revised~~ this TQP, lesson plans and briefings, will be developed for project-specific training. Training will be performance-based, focused on training personnel to perform tasks, rather than procedure-specific.

It is assumed that the following training courses will be developed:

- Mixing system/conveyor operation;
- Vecloader operation;
- Excavator operation;
- HEPA ventilation system operation;
- Air-supplied respirator operation;
- Breathing air system operation;
- CCTV system operation;
- Packaging;
- Emergency response;
- Standing Orders; and
- Safety Basis.

R1-  
F07-  
028

~~The following additional training courses will also be required specifically for Fissile Compounds Operations:~~

- ~~• Shredder Loading and Operation;~~
- ~~• Mixer Clean Out;~~
- ~~• Magnetic Separator Operation; and~~
- ~~• Metal Loading into Dump Trucks.~~

Schedule

The schedule for training development is summarized by the activities in Table 1-5.55. Progress on the key activities will be tracked and reported based upon the designated milestones identified with the completion of the respective activity. Because some activities may be conducted in parallel, an assigned value of progress will be taken upon completion of each individual activity, until 100% cumulative progress has been taken.

**TABLE 1-5.55  
 DEVELOP PRE-OPERATIONS TRAINING SCHEDULE SUMMARY**

	ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
R1-F07-034	HS3E3200	Develop Training (Hammock)	80	--
	HS3E3210	Prepare Silo 3 – Specific TQP <del>Revise TQP with operations update</del>	20	15%
	HS3E3226	Approve Silo 3 – Specific TQP	4 14	10%
R1-F07-028	HS3E3514	Develop and approve Lesson Plan/Briefing (1145 total)	28	5% per plan (55% <del>75%</del> total)
			<b>TOTAL</b>	<b>100%</b>

5.2) Quantification - Develop Pre-operations Training

Labor Resources

The resources for developing Pre-operations Training are summarized in Table 1-5.56. No overtime is planned for this activity.

**TABLE 1-5.56  
 DEVELOP PRE-OPERATIONS TRAINING RESOURCE SUMMARY**

	RESOURCE CODE	FTEs	COMMENTS
R1-F07-025	TPHO	0.5	Engineering Support (Jacobs)
	OPRMGR	0.2	Operations Supervisor input to training
	PROMGR	0.5	Silos Training Lead
	TPSREP	1.0	Technical support for training development
	TRNREP	0.5 <del>1.0</del>	Training rep assigned to project for training development

In addition to these labor resources, which have been included in the Silo 3 baseline, centralized safety analysis personnel will be needed to support the development of Pre-operations Training, but is not included in the baseline.

Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for developing Pre-operations Training are identified in Table 1-5.57.

**TABLE 1-5.57  
 MATERIALS, ODCS, AND SUBCONTRACTS – DEVELOP PRE-OPERATIONS TRAINING**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	None	---

6) Task #6 - Conduct Training

6.1) Plan/Scope - Conduct Training

Training courses will be developed and administered by Fluor Fernald to train personnel to a level commensurate with their job duties and responsibilities. Training will provide the worker with the knowledge of the processes, procedures, tools, and safety measures required to ensure the safety of personnel, property, the public, and the environment. Based on the Silo 3 – Specific revised T&QP, lesson plans and briefings will be developed for project-specific training. Training will be performance-based, focused on training personnel to perform tasks, rather than procedure-specific. Training will consist of classroom training, table-top exercises, and on-the-job training (OJT), as appropriate.

R1-  
F07-  
034

It is assumed that qualification for the following courses will be obtained through classroom training:

- Standing Orders; and
- Safety Basis.

A combination of one hour classroom training and OJT is assumed for the following courses:

- Mixing system/conveyor operation;
- Vecloader operation;
- Excavator operation;
- HEPA ventilation system operation;
- Breathing air system operation;
- Air-supplied respirator operation;
- CCTV system operation;
- Packaging; and
- Emergency response.

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The following additional training will be conducted specifically in support of Fissile Compounds Operations. A combination of one hour classroom training and OJT is assumed for the following courses:

- Shredder Loading and Operation;
- Mixer Clean Out;
- Magnetic Separator Operation; and
- Metal Loading into Dump Trucks.

OJT will be accomplished through SOTs for all of these courses, with the exception of the course on excavator operation. Due to the nature of this operation, OJT for this course will be accomplished separate from SOTs. No refresher courses will be required due to the limited one year operations schedule. Table 1-5.58 identifies which training courses key Silo 3 operations personnel will be required to take, at a minimum:

**TABLE 1-5.58  
TRAINING COURSES REQUIRED BY RESOURCE CODE**

PERSONNEL	STANDING ORDERS	SAFETY BASIS	MIXING SYSTEM	VECLOADER	EXCAVATOR	HEPA	BREATHING AIR	RESPIRATOR	CCTV	PACKAGING	EMERGENCY RESPONSE	SHREDDER OPERATION	MIXER CLEAN-OUT	MAGNETIC SEPARATION	METAL LOADING
PJSMGR	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CHMOPR	X	X	X	X	X	X	X	X	X		X	X	X	X	X
HAZWAT	X	X						X		X	X	X			
MVOOPR	X	X									X				
MNTMGR	X	X									X		X		
MAINT CRAFT		X						X			X		X		
HEOOPR											X				
RIGGER											X		X		
RADTEC	X	X						X			X				
RADMGR	X	X						X			X				
S&HENG	X	X						X			X				

### Schedule

Training will be conducted on one shift. The schedule for training is summarized by the activities in Table 1-5.59. Because several activities may be conducted in parallel, an assigned value of progress will be taken upon completion of each individual activity, until 100% cumulative progress has been taken. This schedule does not include OJT that is accomplished during SOT.

**TABLE 1-5.59  
CONDUCT TRAINING SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HS3E3520	Conduct Training (Hammock)	32	--
HS3E3528	Conduct classroom training (1145 courses total)	18	8% 6% per plan completed (88% 90% max)
HS3E3536	Conduct excavator OJT training	14	12% 10%
			100%

6.2) Quantification - Conduct Training

Labor Resources

The resources for conducting training are summarized in Table 1-5.60. No overtime is planned for this activity.

**TABLE 1-5.60  
CONDUCT TRAINING RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
CHMOPR**	8.0 20.0	Assume operate mixer, Vecloader, additives (projectized)
CRPNTR	0.3	Resource shared from division maintenance pool
ELECTN**	2.0 3.0	Resource shared from division maintenance pool
ENGPRC**	4.0	Process Engineers (projectized)
HAZWAT**	3.0 6.0	Assume operate shredder, close Lift Liners™, install gondola liners, sample (projectized)
HEOOPR	8.0	Assume operate excavator, yard truck, crane (projectized)
INSMEC**	2.0 3.0	Resource shared from division maintenance pool
TPHO	2.0	Systems Engineering support (Jacobs)
MILWRT**	2.0 4.0	Resource shared from division maintenance pool*
MNTMGR**	1.5 3.0	Resource shared from division maintenance management
MNTREP	0.5	Resource shared from division maintenance pool
MVOOPR**	2.0 4.0	Assume move soil, additive bulk bags, operate fork trucks, operate dump trucks (projectized)
OILERM	0.1 0.03	Resource shared from division maintenance pool
OPRMGR**	4.0 5.0	Operations Supervisor, Transportation Supervisor (projectized)
PAINTR	0.1 0.03	Resource shared from division maintenance pool
PIPFTR**	2.0 3.0	Resource shared from division maintenance pool
PJSREP	1.3	Operations and Maintenance support, Maintenance Engineer,

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025

RESOURCE CODE	FTEs	COMMENTS
PRGMGR	0.5	Silos Division Training Lead
QACENG	0.7 <del>0.3</del>	QA lead
RADENG	0.5	Radiological support
RADMGR	1.0	Radiological Supervisor from division
RADTEC**	5.5 <del>8.0</del>	Radiological technician from division pool
RIGGER	2.0	Resource shared from division maintenance pool. Assume load Lift Liners™ onto crane.
S&HENG	0.2 <del>1.0</del>	IH and safety field support (projectized)
TECWRT	1.0	Training documentation development
TPSREP	1.0 <del>0.5</del>	Technical support for training documentation
TRNLAB	2.0	Resource shared from division maintenance pool. Assume cover Lift Liners™ on flatbed.
TRNREP	0.5 <del>1.0</del>	Training support (matrixed to project)
WELDER	0.5	Resource shared from division maintenance pool
WSTENG	0.2	WAO support
WSTMGR		

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234

\* There will be a dedicated Silos maintenance and radiological staff that will be shared between the three projects in the Silos Division- AWR, Silos 1 & 2 and Silo 3. This dedicated staff is able to support all three Silos projects, because the implementation of the project phases - design, construction, start-up, and operations - is staggered, with some minimal overlap.

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028

~~\*\* Some of this crew has been added to support Fissile Compounds Operations second shift.~~

In addition to the labor resources identified above for the conducting training, there are several centralized resources which will need to be trained, but have not been included in the baseline. These include a general laborer, industrial mechanic, porter, laundry, store room attendants, the dioctyl phthalate (DOP) crew, and safety analysis support.

#### Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for conducting training are identified in Table 1-5.61.

**TABLE 1-5.61**  
**MATERIALS, ODCS, AND SUBCONTRACTS – CONDUCT TRAINING**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	None	---

7) Task #7 - Develop System Operability Testing Procedures

7.1) Plan/Scope - Develop System Operability Testing Procedures

Fluor Fernald will develop a System Operability Test (SOT) Plan to establish the testing program for the retrieval and treatment facility start-up. Fluor Fernald will also develop SOT procedures on equipment in the following systems, identifying personnel, testing requirements, system boundaries and standards to be met to ensure that the Silo 3 system meets the design requirements. SOTs will be divided into two categories: retrieval system and treatment system.

The SOT Procedure to support the retrieval system SOT is:

- Retrieval system

SOT Procedures to support the treatment system SOT are:

- Additives system;
- Batch mixing and filling system;
- HEPA system;
- Breathing air system; and
- ~~Shredder System.~~

R1-  
F07-  
028

Schedule

The performance schedule for preparation of the SOT procedures is summarized by the activities in Table 1-5.62. Because several procedures may be conducted in parallel, an assigned value of progress will be taken upon completion of each individual activity, until 100% cumulative progress has been taken.

**TABLE 1-5.62**  
**SYSTEM OPERABILITY TESTING PROCEDURES SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HS3E0900	System Operability Testing Procedures (Hammock)	62	--
HS3E0908	Prepare SOT Procedures (5 6 total)	34	10% 9% per plan completed (50% 54% max)

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F07-  
028

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HS3E0916	Fluor Fernald, Inc. Review and Comment	12	5% <del>3%</del> per plan completed (25% <del>18%</del> max)
HS3E0924	Incorporate Comments and Revise	12	--
HS3E0932	Approve SOT Procedures	4	5% <del>4%</del> per plan completed (25% <del>24%</del> max)
--	All Procedures Approved	--	100% total

## 7.2) Quantification - Develop System Operability Testing Procedures

### Labor Resources

The resources for developing SOT procedures are summarized in Table 1-5.63. No overtime is planned for this activity.

**TABLE 1-5.63  
DEVELOP SOT PROCEDURES RESOURCE SUMMARY**

R1-  
F07-  
025

RESOURCE CODE	FTEs	COMMENTS
ENGINR	<del>1.5</del>	<del>System Engineering support</del>
ENGPRG	<del>2.0</del>	<del>System Engineer assigned to SOT development</del>
TPHO	1.0	Systems Engineering input (Jacobs)
OPRMGR	1.0	Operations Supervisor input
TPSREP	1.0 <del>1.5</del>	Technical support for SOT procedure development

### Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for developing SOT Procedures are identified in Table 1-5.64.

**TABLE 1-5.64  
MATERIALS, ODCS, AND SUBCONTRACTS – DEVELOP SOT PROCEDURES**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	Coleman (CONOPS/Readiness Support) <del>None</del>	\$46,379 —



## 8) Task #8 - Conduct System Operability Tests

### 8.1) Plan/Scope - Conduct System Operability Tests

Conducting System Operability Tests involves the following activities:

- System Operability Tests; and
- System Operability Final Test Report.

#### 8.1)1 Subtask #1 - System Operability Tests

System Operability Testing will be performed by Fluor Fernald to verify process design, proper construction, and that the systems are operational in accordance with the applicable functional facility requirements. Successful completion of SOTs will document the formalized process by which the Silo 3 facility can be turned over to operations having verified that each Silo 3 systems, structures, and components (SSCs) can be operated in a manner that is safe to personnel, equipment and environment.

R1-  
F07-  
028

SOTs will be performed in two phases. ~~SOTs for the treatment system must be completed prior to the processing of fissile compounds. However, retrieval system SOTs do not need to be completed for fissile compounds operations. Retrieval system SOTs must be completed prior to the ORR for Silo 3 Operations.~~ The first phase will involve SOTs on the retrieval system equipment. The second phase of SOTs will be conducted on the treatment system equipment, including the following components:

- Additives system;
- Batch mixing and filling system;
- HEPA system; and
- Breathing air system.
- ~~Shredder System.~~

#### 8.1)2 Subtask #2 - System Operability Final Test Report

Fluor Fernald will prepare a Final Test Report when all sections of the SOT Procedures and identified retests are complete, providing the results of the SOTs, any system modifications or corrective actions, and the conclusion regarding acceptance of facility/process. The Final Test Report will contain the following information:

- a. Form FS-F-3982
- b. Explanations of Test Exceptions
- c. Test Procedure Change Notices (TPCN)
- d. System modifications
- e. Corrective actions
- f. Design Change Notices (DCN)

- g. Comparison of the test data with the acceptance criteria
- h. Conclusion regarding acceptance of facility/process

Schedule

The performance schedule for conducting system operability testing and completing the test report is summarized by the activities in Table 1-5.65. Because several procedures may be conducted in parallel, an assigned value of progress will be taken upon completion of each individual activity, until 100% cumulative progress has been taken.

**TABLE 1-5.65  
 SYSTEM OPERABILITY TESTING SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HS3E1000	System Operability Testing (Hammock)	35 54	--
<del>HS3E1010</del>	<del>System Operability Tests — RETR</del>	<del>54</del>	<del>--</del>
HS3E1015	Conduct SOTs (5 4 total) — RETR.	18 34	15% per plan completed (75% 15% max)
HS3E1025	Incorporate SOT LL/Complete SOT Report — RETR	17	15%
<del>HS3E1110</del>	<del>System Operability Tests — TREAT</del>	<del>49</del>	<del>--</del>
<del>HS3E1115</del>	<del>Conduct SOTs (5 total) — TREAT</del>	<del>24</del>	<del>15% per plan completed (75% max)</del>
<del>HS3E1120</del>	<del>Surrogate Run — TREAT</del>	<del>8</del>	<del>--</del>
<del>HS3E1125</del>	<del>Incorporate SOT LL/Complete SOT Report — TREAT</del>	<del>17</del>	<del>5%</del>
		TOTAL	100%

8.2) Quantification - Conduct System Operability Tests

Labor Resources

The resources for conducting SOTs are summarized in Table 1-5.66. ~~No overtime is planned for this activity.~~

**TABLE 1-5.66**  
**SYSTEM OPERABILITY RESOURCE SUMMARY**

R1- F07- 028	RESOURCE CODE	FTEs	COMMENTS
	CHMOPR**	8.0 <del>20.0</del>	Assume operate mixer, Vecloader, additives (projectized)
R1- F07- 025	CRPNTR	0.3	Resource shared from division maintenance pool
	ELECTN**	2.0 <del>3.0</del>	Resource shared from division maintenance pool
	ENGPRC**	4.0	<del>Process Engineers (projectized)</del>
	HAZWAT**	3.0 <del>6.0</del>	Assume operate shredder, close Lift Liners™, install gondola liners, sample (projectized)
	HEOOPR	8.0	Assume operate excavator, yard truck, crane (projectized)
	INDHYG	0.2	IH support
	INSMEC**	2.0 <del>3.0</del>	Resource shared from division maintenance pool
	TPHO	2.0	System Engineering Support (Jacobs)
	MILWRT**	2.0 <del>4.0</del>	Resource shared from division maintenance pool
	MNTMGR**	1.5 <del>3.0</del>	Resource shared from division maintenance management
	MNTREP	0.5	Resource shared from division maintenance pool
	MVOOPR**	2.0 <del>4.0</del>	Assume move soil, additive bulk bags, operate fork trucks, operate dump trucks (projectized)
	OILERM	0.1 <del>0.03</del>	Resource shared from division maintenance pool
	OPRMGR**	4.0 <del>6.0</del>	Operations Supervisor, Transportation Supervisor (projectized)
	PAINTR	0.1 <del>0.03</del>	Resource shared from division maintenance pool
	PIPFTR**	2.0 <del>3.0</del>	Resource shared from division maintenance pool
	PJSREP	1.3	Operations and Maintenance support, Maintenance Engineer,
	PROMGR	0.5	Silos Division Training Lead
	QACENG	0.7 <del>0.3</del>	QA lead
	RADENG	1.1	Rad support
	RADMGR	1.0	Radiological Supervisor from division
	RADTEC**	7.0 <del>8.0</del>	Radiological technician from division pool
	RIGGER	2.0	Resource shared from division maintenance pool. Assume load Lift Liners™ onto crane.
	S&HENG	1.0	IH and safety field support (projectized)
	TECWRT	1.0	Prepare SOT documentation
	TPSREP	2.0 <del>0.5</del>	Technical support for SOT training documentation
	TRNLAB	2.0	Resource shared from division maintenance pool. Assume cover Lift Liners™ on flatbed.
	TRNREP	0.5 <del>1.0</del>	Training support (matrixed to project)
	WELDER	1.0 <del>0.5</del>	Resource shared from division maintenance pool
	WSTENG	0.5 <del>0.2</del>	WAO support
	WSTMGR		

In addition to these labor resources, which have been included in the Silo 3 baseline, there are several centralized resources, which will support SOTs, but have not been included in the baseline. These include a general laborer, industrial mechanic, porter, laundry, store room attendants, the dioctyl phthalate (DOP) crew, and safety analysis support.

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~~\*\* Some of this crew has been added to support Fissile Compounds Operations second shift.~~

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471

During the Conduct System Operability Test subtask, overtime will be incurred; however, the individual resources requiring overtime will vary. Overtime is estimated to be 25%. Table 1-5.66a indicates an estimate, in manhours, for 25% overtime:

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025

**TABLE 1-5.66a**  
**CONDUCT SYSTEM OPERABILITY OVERTIME SUMMARY**

<u>RESOURCE CODE</u>	<u>FTEs</u>	<u>REGULAR HOURS</u>	<u>OVERTIME HOURS</u>	<u>TOTAL MAN-HOURS</u>
CHMOPR	8.0	2528	632	3160
CRPNTR	0.3	95	24	119
ELECTN	2.0	632	158	790
HAZWAT	3.0	948	237	1185
HEOOPR	8.0	2528	632	3160
INDHYG	0.2	63	16	79
INSMEC	2.0	632	158	790
TPHO	2.0	632	158	790
MILWRT	2.0	632	158	790
MNTMGR	1.5	474	119	593
MNTREP	0.5	158	40	198
MVOOPR	2.0	632	158	790
OILERM	0.1	32	8	40
OPRMGR	4.0	1264	316	1580
PAINTR	0.1	32	8	40
PIPFTR	2.0	632	158	790
PJSREP	1.3	411	103	514
PRGMGR	0.5	158	40	198
QACENG	0.7	221	55	276
RADENG	1.1	348	87	435
RADMGR	1.0	316	79	395
RADTEC	7.0	2212	553	2765
RIGGER	2.0	632	158	790
S&HENG	1.0	316	79	395
TECWRT	1.0	316	79	395
TPSREP	2.0	632	158	790
TRNLAB	2.0	632	158	790
TRNREP	0.5	158	40	198
WELDER	1.0	316	79	395
WSTENG	0.5	158	40	198
<b>TOTAL MAN-HOURS</b>		<b>18740</b>	<b>4688</b>	<b>23428</b>

Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for conducting SOTs are identified in Table 1-5.67.

**TABLE 1-5.67  
MATERIALS, ODCS, AND SUBCONTRACTS – SYSTEM OPERABILITY TESTS**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	None	---

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~~A soil surrogate, provided by the Nuclear Materials Project in drums, will be used to test treatment system equipment during SOTs.~~

~~9) Task #9 Fissile Compounds Standard Startup Review~~

~~9.1) Plan/Scope Fissile Compounds Standard Startup Review~~

~~Upon completion of SOTs and processing of surrogate, a Standard Startup Review (SSR) will be conducted to begin the processing of Fissile Compounds. Prior to the start of the SSR, Fluor Fernald will conduct an operational readiness self-assessment. Fluor Fernald will develop a readiness plan for the Fissile Compounds Operations. The Silo 3 Project team and/or Fluor Fernald Readiness Team will then develop an implement a Plan of Action (POA) and a Readiness Implementation Plan, as appropriate.~~

~~9.1)1 Subtask #1 Operational Readiness Self-Assessment~~

~~Fluor Fernald will perform an Operational Readiness Self-Assessment to verify that the project is ready to commence operations in accordance with site requirements. The requirements and approach for this self-assessment will be based on the areas to be reviewed during the SSR, and will be completed to ensure that documentation, training and qualification of personnel, and status of equipment are satisfactory prior to the declaration of readiness.~~

~~9.1)2 Subtask #2 Standard Startup Review~~

~~The SSR will be conducted by Fluor Fernald to ensure that the facility and personnel are prepared to operate safely and effectively. The readiness review will include an evaluation of personnel and qualifications, facility and process hardware, engineering and administrative controls, procedures and training against documented safety and design bases.~~

~~A Project Readiness Team will use a graded approach to verify the following five (5) areas are satisfactory to commence operations from site requirements:~~

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● ~~Hardware and Systems~~

~~Procedures and controls for operating the process systems and utility systems are correct and adequate. Project safety documentation is in place that describes the safety envelope and implements adequate and safe controls. SSCs are operable and in satisfactory condition as defined in the project plans and safety requirements.~~

● ~~Personnel and Organization~~

~~Training and qualification programs for operations and operations support personnel have been established, documented, and implemented. There are sufficient numbers of qualified personnel to support safe operations. A routine emergency operations drill program including program records, has been developed, established, and implemented. Technical management qualifications of personnel responsible for facility operations are adequate. Level of knowledge of operations and operations support personnel is adequate. Personnel exhibit an awareness of public and worker safety, health and environmental protection requirements, and through their actions, demonstrate a high priority commitment to comply with these requirements. Functions, assignments, responsibilities, and reporting relationships are clearly defined, understood, and effectively implemented with line management for control of safety. The formality and discipline of operations are adequate to work safely.~~

● ~~Management Programs~~

~~A process has been established to identify, evaluate, and resolve deficiencies and recommendations made by oversight groups, review teams, and audit organizations. A systematic review of the facility's conformance to applicable DOE Orders has been performed. Functional area programs, such as Maintenance, Radiological Protection, Industrial Safety and Health, and Quality Assurance are adequate to support the project.~~

● ~~Operating Procedures~~

~~Procedures necessary for operation have been identified, prepared, and approved. Operational constraints, terms, and conditions or limiting conditions (if any) are identified in operating procedures or other documents. Workability and completeness of procedures have been verified in the field. Procedures are controlled and have been distributed and made available to workers.~~

● ~~Support Organizations~~

~~Training and qualification programs that cover the entire range of duties for operations support personnel have been established, documented, and implemented. Level of~~

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knowledge of support personnel is adequate based upon reviews of test results, personnel interviews, and observation of work practices.

Schedule

The performance schedule for conducting the Fissile Compounds SSR is summarized by the activities in Table 1-5.67a.

**TABLE 1-5.67a**  
**FISSILE COMPOUNDS SSR SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HS3E1200	Fissile Compounds SSR (Hammock)	20	—
HS3E1210	Operational Readiness Self Assessment	8	25%
HS3E1220	Conduct SSR	12	75%
		TOTAL	100%

All activities are assumed to have a "finish to start" relationship. Progress on the key activities will be tracked and reported based upon the designated milestones identified with the completion of the respective activity.

9.2) Quantification Fissile Compounds Standard Startup Review

Labor Resources

The resources required for the Fissile Compound SSR is identified in Table 1-5.67b. No overtime is planned for this activity.

**TABLE 1-5.67b**  
**FISSILE COMPOUNDS SSR RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
TPSREP	0.5	Technical support for training documentation
TRNREP	1.0	Training support (matrixed to project)
ENGPRC**	4.0	Process Engineers (projectized)
OPRMGR**	5.0	Operations Supervisor, Transportation Supervisor (projectized)
CHMOPR**	20.0	Assume operate mixer, Vecloader, additives (projectized)
HEOOPR	8.0	Assume operate excavator, yard truck, crane (projectized)
HAZWAT**	6.0	Assume operate shredder, close Lift Liners™, install gondola liners, sample (projectized)
MVOOPR**	4.0	Assume move soil, additive bulk bags, operate fork trucks, operate dump trucks (projectized)

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RESOURCE CODE	FTEs	COMMENTS
MNTMGR**	3.0	Resource shared from division maintenance management
MILWRT**	4.0	Resource shared from division maintenance pool
PIPFTR**	3.0	Resource shared from division maintenance pool
ELECTN**	3.0	Resource shared from division maintenance pool
INSMEC**	3.0	Resource shared from division maintenance pool
WELDER	0.5	Resource shared from division maintenance pool
RIGGER	2.0	Resource shared from division maintenance pool. Assume load Lift Liners™ onto crane.
TRNLAB	2.0	Resource shared from division maintenance pool. Assume cover Lift Liners™ on flatbed.
CRPNTR	0.3	Resource shared from division maintenance pool
OILERM	0.03	Resource shared from division maintenance pool
PAINTR	0.03	Resource shared from division maintenance pool
S&HENG	1.0	IH and safety field support (projectized)
RADTEC**	8.0	Radiological technician from division pool
RADMGR	1.0	Radiological Supervisor from division
QACENG	0.3	QA lead
WSTMGR	0.2	WAO support

In addition to these labor resources, which have been included in the Silo 3 baseline, there are several centralized resources, which will support SOTs, but have not been included in the baseline. These include a general laborer, industrial mechanic, porter, laundry, store room attendants, the dioctyl phthalate (DOP) crew, and safety analysis support. The Fluor Fernald personnel conducting the SSR are centralized as well, and are not baselined in the project account.

\*\* Some of this crew has been added to support Fissile Compounds Operations second shift.

#### Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Fissile Compounds SSR are identified in Table 1-5.67c.

**TABLE 1-5.67c**  
**MATERIALS, ODCS, AND SUBCONTRACTS — FISSILE COMPOUNDS SSR**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	—
ODCs	None	—
Subcontracts	None	—



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~~10) Task #10 Fissile Compounds Operations~~

~~10.1) Plan/Scope Fissile Compounds Operations~~

~~As part of the Fissile Compounds Operations task, the following activities will be performed:~~

- ~~• Drum and Soil Receipt;~~
- ~~• Blending;~~
- ~~• Truck Loading;~~
- ~~• Facility Ownership; and~~
- ~~• Utilities.~~

~~10.1)1 Subtask #1 Drum and Soil Receipt~~

~~NMD will deliver approximately 2,450 drums of fissile compounds to the Silo 3 Project for blending with soil. NMD will also supply the soil for blending operations. Soil will be stockpiled between the Silo 3 and Silo 4 structures. The Silo 3 Project will transfer soil from the stockpile to the treatment facility.~~

~~NMD will deliver one safe mass group (assumed to be 4 drums) to the Silo 3 Project to ensure a safe configuration is maintained and to prevent criticality concerns. The amount of soil required for blending the fissile compounds to meet DOT requirements and the Envirocare WAC will be determined by NMD. The blending formulation for each set of drums will be provided to the Silo 3 Project with each delivery.~~

~~10.1)2 Subtask #2 Blending~~

~~Blending of fissile compounds with soil will be operated using a batch process. One drum of fissile compounds will be processed per batch. Each drum will be placed into a shredder for size reduction. Size-reduced material will then be transferred to a conveyor where the metal drum fragments will be magnetically segregated from the fissile compounds and removed from the blending process. Fissile compounds will then be conveyed to a ribbon blender for mixing with soil and water. Soil will be removed from the stockpile and transferred to a soil hopper in the treatment facility. Soil will then be transferred from the hopper to the ribbon blender via a conveyor. Blending of fissile compounds with soil will be performed as a batch process with the treatment process double-ribbon blender. In addition, water may also be added to the mixture to ensure that moisture content meets the Envirocare WAC. The amount of water added will be determined through sampling and analysis of soil blended in the stockpile prior to mixing. Sampling and analysis for moisture content of soil will be managed and performed by the Silo 3 Project. Addition of water will be performed with the Silo 3 water process system.~~

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~~10.1)3 Subtask #3 — Truck Loading~~

~~Blending material will be placed into a dump truck along with metal drum fragments. One dump truck will consist of one batch (four drums) of blended material. Loaded dump trucks will be transferred to NMD (PBS 08). NMD will transfer dump trucks for the Silo 3 Treatment Facility to the WPRAP Facility where NMD will transfer the blended material to WPRAP (PBS 05). WPRAP will be responsible for transportation and disposal of blended material at Envirocare. WPRAP will also be responsible for confirmation sampling and analysis with the Envirocare WAC. Non-destructive gamma analysis will be performed on the loaded waste to verify the proper blending of uranium to meet the WAC. WAC compliance will be confirmed by formal analyses performed by WPRAP.~~

~~10.1)4 Subtask #4 — Facility Ownership~~

~~The facility ownership scope of work includes maintenance, coordination, waste treatment, and operations for facility management services of the Silos area land, systems, structures, components and utilities. A more detailed description of Facility Ownership activities can be found in Section 1.5.6 (Subtask #4).~~

~~10.1)5 Subtask #5 — Utilities~~

~~DOE will pay utility costs for the Fissile Compounds Operations. Utility costs for the Silo 3 Project are estimated in the PBS 01 baseline.~~

~~Schedule~~

~~Processing of fissile compounds is scheduled to take 11 weeks. Performance will be measured based on the number of drums processed. The total quantity to be processed is assumed to be 2,450 drums. Percent complete will be determined as follows:~~

$$\text{Percent complete} = \text{drums processed} / 2,450 \text{ drums total.}$$

~~10.2) Quantification — Fissile Compounds Operations~~

~~Labor Resources~~

~~The resources required for Fissile Compound Operations to support the processing of fissile compounds are identified in Tables 1-5.67d and 1-5.67e. Fissile Compound Operations must be conducted on two shifts in order to ensure Silo 3 material can still be processed consistent with its drives. A third shift skeleton crew will also be utilized to clean-out equipment and perform maintenance. Table 1-5.67d represents those personnel working on the first shift.~~

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**TABLE 1-5.67d**  
**FISSILE COMPOUNDS OPERATIONS—SHIFT 1 RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
TPSREP	0.5	Technical support for training documentation
TRNREP	1.0	Training support (matrixed to project)
ENGPRC	2.0	Process Engineers (projectized)
OPRMGR	2.0	Operations Supervisor, Transportation Supervisor (projectized)
CHMOPR	8.0	Assume operate mixer (projectized)
HEOOPR	8.0	(Projectized)
HAZWAT	3.0	Assume shredder (projectized)
MVOOPR	2.0	Assume move soil and operate dump trucks (projectized)
MNTMGR	2.0	Resource shared from division maintenance management
MILWRT	2.0	Resource shared from division maintenance pool
PIPFTR	2.0	Resource shared from division maintenance pool
ELECTN	2.0	Resource shared from division maintenance pool
INSMEG	2.0	Resource shared from division maintenance pool
WELDER	0.5	Resource shared from division maintenance pool
RIGGER	2.0	Resource shared from division maintenance pool
TRNLAB	2.0	Resource shared from division maintenance pool
CRPNTR	0.3	Resource shared from division maintenance pool
OILERM	0.03	Resource shared from division maintenance pool
PAINTR	0.03	Resource shared from division maintenance pool
S&HENG	1.0	IH and safety field support (projectized)
RADTEC	4.0	Radiological technician from division pool
RADMGR	1.0	Radiological Supervisor from division
QACENG	0.3	QA lead
WSTMGR	0.2	WAO support

Table 1-5.67e indicates those individuals that will work on the back shift (second or third shift) and be paid a premium rate.

**TABLE 1-5.67e**  
**FISSILE COMPOUND OPERATIONS—SHIFT 2/3**

RESOURCE CODE	FTEs	COMMENTS
ENGPRC	2.0	Process engineering support (projectized)
OPRMGR	3.0	Operations Supervisor, Transportation Supervisor
CHMOPR	12.0	Projectized
HAZWAT	3.0	Assume operate mixer
MVOOPR	2.0	Assume operate dump trucks
MNTMGR	1.0	Maintenance Supervisor
MILWRT	2.0	Resource shared from division maintenance pool

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RESOURCE CODE	FTEs	COMMENTS
PIPFTR	1.0	Resource shared from division maintenance pool
ELECTN	1.0	Resource shared from division maintenance pool
INSMEC	1.0	Resource shared from division maintenance pool
RADTEC	4.0	Radiological tech support form division pool

In addition to these labor resources, which have been included in the Silo 3 baseline, there are several centralized resources, which will support SOTs, but have not been included in the baseline. These include a general laborer, industrial mechanic, porter, laundry, store room attendants, the dioctyl phthalate (DOP) crew, and safety analysis support. Personnel performing non-destructive gamma spec analysis are also centralized and have not been included in this baseline.

Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Fissile Compounds Operations are identified in Table 1-5.67f.

**TABLE 1-5.67f**  
**MATERIALS, ODCS, AND SUBCONTRACTS — FISSILE COMPOUNDS OPERATIONS**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	—
ODCs	None	—
Subcontracts	None	—

11) Task #11 — Prepare Silo 3 Operations

11.1) Plan/Scope — Prepare Silo 3 Operations

Following the completion of Fissile Compounds Operations, preparation for Silo 3 Operations will begin. Preparing for Silo 3 Operations includes equipment installation and removal of select equipment, training updates and a new operational readiness self-assessment targeted towards Silo 3 specifications.

11.1)1 Subtask #1 — Install Equipment

The retrieval and treatment equipment required for the Silo 3 process, which could not be installed prior to Fissile Compounds Operations, will be installed in the facility. This includes the retrieval equipment and conveyor for the retrieval system to the mixer. Any equipment utilized during Fissile Compounds Operations that is not required for Silo 3 retrieval and treatment, may be removed as well.

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#### 11.1)2 Subtask #2 Update Training

Classroom training will be conducted to update personnel on Silo 3 specific controls and requirements for operations. No new training on equipment will be required, as Silo 3 personnel will have gained extensive hands-on experience during fissile compounds processing

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#### 11.1)3 Subtask #3 Operational Readiness Self Assessment

Fluor Fernald will perform an Operational Readiness Self Assessment to verify that the project is ready to commence operations in accordance with site requirements. The requirements and approach for this self assessment will be based on the areas to be reviewed during the ORR, and will be completed to ensure that documentation, training and qualification of personnel, and status of equipment are satisfactory prior to the declaration of readiness.

Fluor Fernald will develop a readiness plan for the Silo 3 Project. The Silo 3 Project team and/or Fluor Fernald Readiness Team will then develop and implement a Plan of Action (POA) and a Readiness Implementation Plan, as appropriate.

#### Schedule

The performance schedule for Preparing for Silo 3 Operations is summarized by the activities in Table 1-5.67g.

**TABLE 1-5.67g**  
**PREPARE FOR SILO 3 OPERATIONS SCHEDULE SUMMARY**

ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HS3E1300	Operations Preparation (Hammock)	24	—
HS3E1310	Install Equipment	12	30%
HS3E1310	Update Training	12	60%
HS3E1320	Operational Readiness Self Assessment	12	100%

#### 11.2) Quantification Prepare Silo 3 Operations

#### Labor Resources

At this point, the additional labor that was required to support Fissile Compounds back shift operations will be released. A core group dedicated to Silo 3 Operations will remain on the project. The resources required to Prepare for Silo 3 Operations are identified in Table 1-5.67h. No overtime is planned for this activity.

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**TABLE 1-5.67h**  
**PREPARE FOR SILO 3 OPERATIONS RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
TPSREP	0.5	Technical support for training documentation
TRNREP	1.0	Training support (matrixed to project)
ENGPRC	2.0	Process Engineers (projectized)
OPRMGR	2.0	Operations Supervisor, Transportation Supervisor (projectized)
CHMOPR	8.0	Assume operate mixer, Vecloader, additives (projectized)
HEOOPR	8.0	Assume operate excavator, yard truck, crane (projectized)
HAZWAT	3.0	Assume close Lift Liners™, install gondola liners (projectized)
MVOOPR	2.0	Move additive bulk bags, operate fork trucks (projectized)
MNTMGR	2.0	Resource shared from division maintenance management
MILWRT	2.0	Resource shared from division maintenance pool
PIPFTR	2.0	Resource shared from division maintenance pool
ELECTN	2.0	Resource shared from division maintenance pool
INSMEG	2.0	Resource shared from division maintenance pool
WELDER	0.5	Resource shared from division maintenance pool
RIGGER	2.0	Resource shared from division maintenance pool. Assume load Lift Liners™ onto crane.
TRNLAB	2.0	Resource shared from division maintenance pool. Assume cover Lift Liners™ on flatbed.
CRPNTR	0.3	Resource shared from division maintenance pool
OILERM	0.03	Resource shared from division maintenance pool
PAINTR	0.03	Resource shared from division maintenance pool
S&HENG	1.0	IH and safety field support (projectized)
RADTEG	4.0	Radiological technician from division pool
RADMGR	1.0	Radiological Supervisor from division
QACENG	0.3	QA lead
WSTMGR	0.2	WAO support

In addition to these labor resources, which have been included in the Silo 3 baseline, there are several centralized resources, which will support Preparation for Silo 3 Operations, but have not been included in the baseline. These include a general laborer, industrial mechanic, porter, laundry, store room attendants, the dioctyl phthalate (DOP) crew, and safety analysis support.

**Materials, ODCs, and Subcontracts**

The materials, ODCs, and subcontracts for preparing for Silo 3 Operations are identified in Table 1-5.67i.

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**TABLE 1-5.67i**  
**MATERIALS, ODCS, AND SUBCONTRACTS PREPARE FOR SILO 3 OPERATIONS**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	None	---

12) 9) Task #9 12 - Operational Readiness Review

12.1) 9.1) Plan/Scope - Operational Readiness Review

Operational readiness ensures that the facility and personnel are prepared to operate safely and effectively. The readiness review includes an evaluation of personnel and qualifications, facility and process hardware, engineering and administrative controls, procedures and training against documented safety and design bases. At this time, it is expected that an Operational Readiness Review (ORR) will be required for Silo 3 Operations.

A Project Readiness Team will use a graded approach to verify the following five (5) areas are satisfactory to commence operations from site requirements:

- **Hardware and Systems**

Procedures and controls for operating the process systems and utility systems are correct and adequate. Project safety documentation is in place that describes the safety envelope and implements adequate and safe controls. SSCs are operable and in satisfactory condition as defined in the project plans and safety requirements.

- **Personnel and Organization**

Training and qualification programs for operations and operations support personnel have been established, documented, and implemented. There are sufficient numbers of qualified personnel to support safe operations. A routine emergency operations drill program including program records, has been developed, established, and implemented. Technical management qualifications of personnel responsible for facility operations are adequate. Level of knowledge of operations and operations support personnel is adequate. Personnel exhibit an awareness of public and worker safety, health and environmental protection requirements, and through their actions, demonstrate a high priority commitment to comply with these requirements. Functions, assignments, responsibilities, and reporting relationships are clearly defined, understood, and effectively implemented with line management for control of safety. The formality and discipline of operations are adequate to work safely.

- Management Programs

A process has been established to identify, evaluate, and resolve deficiencies and recommendations made by oversight groups, review teams, and audit organizations. A systematic review of the facility's conformance to applicable DOE Orders has been performed. Functional area programs, such as Maintenance, Radiological Protection, Industrial Safety and Health, and Quality Assurance are adequate to support the project.

- Operating Procedures

Procedures necessary for operation have been identified, prepared, and approved. Operational constraints, terms, and conditions or limiting conditions (if any) are identified in operating procedures or other documents. Workability and completeness of procedures have been verified in the field. Procedures are controlled and have been distributed and made available to workers.

- Support Organizations

Training and qualification programs that cover the entire range of duties for operations support personnel have been established, documented, and implemented. Level of knowledge of support personnel is adequate based upon reviews of test results, personnel interviews, and observation of work practices.

~~9.1)1 Subtask #1 - Operational Readiness Self Assessment~~

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~~Fluor Fernald will perform an Operational Readiness Self Assessment to verify that the project is ready to commence operations in accordance with site requirements. The requirements and approach for this self assessment will be based on the areas to be reviewed during the ORR, and will be completed to ensure that documentation, training and qualification of personnel, and status of equipment are satisfactory prior to the declaration of readiness.~~

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~~Fluor Fernald will develop a readiness plan for the Silo 3 Project. The Silo 3 Project team and/or Fluor Fernald Readiness Team will then develop an implement a Plan of Action (POA) and a Readiness Implementation Plan, as appropriate.~~

~~12.1)1~~ 9.1)1 Subtask #1 - Fluor Fernald ORR

An Operational Readiness Review (ORR) is an independent, disciplined, systematic, documented, performance-based examination of facilities, equipment, personnel, procedures, and management control systems to ensure that an activity will be operated safely within its approved safety envelope as defined by the Silo 3 safety basis. The ORR will base its scope on the relationship of the Silo 3 remediation activity to a minimum set of core requirements defined in site procedures and DOE Orders. A graded approach will



be used to define the depth of the ORR based on these core requirements. ~~Credit will be taken for the Fissile Compounds SSR activity, allowing a graded approach to be applied for the Silo 3 ORR.~~

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#### ~~12.1)2~~ 9.1)2 Subtask #2 - DOE ORR

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The facility/system start-up authority is a function of the final hazard categorization of the facility. For facilities that are HC1 and HC2, the DOE Ohio Field Office (DOE-OFO) has startup authority. For HC3 facilities, such as the Silo 3, the DOE-FEMP has startup authority. For radiological or other industrial hazards (OIH) and standard industrial hazards (SIH), Fluor Fernald has been delegated startup authority. Following the Fluor Fernald ORR, DOE-FEMP will conduct an ORR and give approval to start operations, once findings and observations, if any, have been resolved.

#### Schedule

The schedule for conducting the ORR is summarized by the activities in Table 1-5.68. All activities are assumed to have a "finish to start" relationship. Progress on the key activities will be tracked and reported based upon the designated milestones identified with the completion of the respective activity. Milestone percent completes indicated are cumulative.

**TABLE 1-5.68  
ORR SCHEDULE SUMMARY**

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ACTIVITY NO.	ACTIVITY DESCRIPTION	DURATION (WORKDAYS)	MILESTONE
HS3E1400	Silo 3 Operational Readiness Reviews (Hammock)	<del>59</del> 32	--
<del>HS3E1410</del>	<del>Conduct Operational Readiness Self-Assessment</del>	16	25%
<del>HS3E1420</del>	<del>Operational Readiness Self-Assessment Lessons Learned</del>	8	--
HS3E1450	Initiate - Fluor Fernald Conduct ORR	18-16	--
	Complete - Fluor Fernald Conduct ORR		70%
HS3E1460	Initiate - DOE Conduct ORR	17-16	--
	Complete - DOE Conduct ORR		100%
<del>HS3E1410</del>	<del>Declaration of Readiness</del>	<del>1</del>	<del>25%</del>
	<del>Complete Fluor Fernald ORR</del>	<del>17</del>	<del>70%</del>
<del>HS3E1460</del>	<del>Complete DOE ORR</del>	<del>17</del>	<del>100%</del>

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12.2) 9.2) Quantification - Operational Readiness Review

Labor Resources

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The resources for ORR are summarized in Table 1-5.69. ~~No overtime is planned for this activity.~~

**TABLE 1-5.69  
ORR RESOURCE SUMMARY**

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RESOURCE CODE	FTEs	COMMENTS
CHMOPR	8.0	Assume operate mixer, Vecloader, additives (projectized)
CRPNTR	0.3	Resource shared from division maintenance pool
ELECTN	2.0	Resource shared from division maintenance pool
ENGPRC	2.0	Process engineering support
HAZWAT	3.0	Assume close Lift Liners™, install gondola liners (projectized)
HEOOPR	8.0	Assume operate excavator, yard truck, crane (projectized)
INDHYG	0.5	IH support
INSMEC	2.0	Resource shared from division maintenance pool
TPHO	2.0	Engineering Support (Jacobs)
MILWRT	2.0	Resource shared from division maintenance pool
MNTMGR	1.5 <del>2.0</del>	Resource shared from division maintenance management
MNTREP	0.5	Revise maintenance work orders based on ORR lessons learned
MVOOPR	2.0	Move additive bulk bags, operate fork trucks (projectized)
OILERM	0.1 <del>0.03</del>	Resource shared from division maintenance pool
OPRMGR	4.0 <del>3.0</del>	Operations Supervisor, Transportation Supervisor (projectized)
PAINTR	0.1 <del>0.03</del>	Resource shared from division maintenance pool
PIPFTR	2.0	Resource shared from division maintenance pool
PJSREP	1.3 <del>0.3</del>	Operations and Maintenance support, Maintenance Engineer
PROMGR	0.5	Silos Division Training Lead
QACENG	1.0	QA lead
RADENG	1.5	Radiological support
RADMGR	1.0	Radiological Supervisor from division
RADTEC	7.0 <del>4.0</del>	Radiological technician from division pool
RIGGER	2.0	Resource shared from division maintenance pool. Assume load Lift Liners™ onto crane.
S&HENG	1.0	S&H support (projectized)
TECWRT	1.0 <del>0.5</del>	Revise procedures based on ORR findings/observations
TPSREP	3.0 <del>2.0</del>	Technical support for ORR
TRNLAB	2.0	Resource shared from division maintenance pool. Assume cover Lift Liners™ on flatbed.
TRNREP	0.5 <del>1.0</del>	Training support (matrixed)
WELDER	0.5	Resource shared from division maintenance pool

R1-F07-025	RESOURCE CODE	FTEs	COMMENTS
	WSTENG WSTMGR	0.5	WAO support

In addition to these labor resources, which have been included in the Silo 3 baseline, there are several centralized resources, which will support ORR, but have not been included in the baseline. These include a general laborer, industrial mechanic, porter, laundry, store room attendants, the dioctyl phthalate (DOP) crew, and safety analysis support. The ORR team is centralized as well, and is not baselined in the project account.

R1-D-471 During the ORR subtask, overtime will be incurred; however, the individual resources requiring overtime will vary. Overtime is estimated to be 25%. Table 1-5.69a indicates an estimate, in manhours, for 25% overtime:

R1-F07-025	TABLE 1-5.69a ORR OVERTIME SUMMARY				
	RESOURCE CODE	FTEs	REGULAR HOURS	OVERTIME HOURS	TOTAL MAN-HOURS
	CHMOPR	8.0	4184	1046	5230
	CRPNTR	0.3	157	39	196
	ELECTN	2.0	1046	262	1308
	HAZWAT	3.0	1569	392	1961
	HEOOPR	8.0	4184	1046	5230
	INDHYG	0.5	262	66	328
	INSMEC	2.0	1046	262	1308
	TPHO	2.0	1046	262	1308
	MILWRT	2.0	1046	262	1308
	MNTMGR	1.5	785	196	981
	MNTREP	0.5	262	66	328
	MVOOPR	2.0	1046	262	1308
	OILERM	0.1	52	13	65
	OPRMGR	4.0	2092	523	2615
	PAINTR	0.1	52	13	65
	PIPFTR	2.0	1046	262	1308
	PJSREP	1.3	680	170	850
	PRGMGR	0.5	262	66	328
	QACENG	1.0	523	131	654
	RADENG	1.5	785	196	981
	RADMGR	1.0	523	131	654
	RADTEC	7.0	3661	915	4576
	RIGGER	2.0	1046	262	1308
	S&HENG	1.0	523	131	654
	TECWRT	1.0	523	131	654
	TPSREP	3.0	1569	392	1961

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	TRNLAB	2.0	1046	262	1308
R1-F07-025	TRNREP	0.5	262	66	328
	WELDER	0.5	262	66	328
	WSTENG	0.5	262	66	328
	<b>TOTAL MAN-HOURS</b>		<b>31802</b>	<b>7957</b>	<b>39759</b>

Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for ORR are identified in Table 1-5.70.

**TABLE 1-5.70  
MATERIALS, ODCS, AND SUBCONTRACTS – ORR**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	None	---

**1.5.6 HS3AF - Remedial Action**

As part of the remedial action for Silo 3, the following activities will be performed during the Operations task:

- Retrieval;
- Treatment;
- Packaging and Preparation for shipment;
- Facility ownership; and
- Utilities.

**1) Task #1 - Operations**

**1.1) Plan/Scope – Operations**

The remedial design process flow includes extraction of the material from the silo as dry material [Assumption RD6] and conveyance to the treatment facility [Assumption RD7].

**1.1)1 Subtask #1 - Retrieval**

Retrieval includes access through the silo walls, extraction of the material and transfer to a hopper - the entry point of the treatment process. All material, including "nontypical

waste" must be removed from the silo, leaving the silo floor and walls "visibly free" of material.

#### Accessing the Silo

Material in the silo will be accessed through a containment enclosure and a 15' h x 15' w opening cut in the side of the silo using a water laser. It is assumed that a specialty vendor will be hired to perform this service. The Silo 3 contents would be accessed through this penetration at the base of the silo wall. This opening would allow the excavator to be advanced into Silo 3 to perform bulk material retrieval. Based on radon concentrations, it is assumed that no radon treatment will be required.

Scaffolding will be erected for accessing the opening, with two "towers" on either side of the opening and a 20 ft. pick board, equipped with handrails, spanning the opening. The opening would be laid out and cut into three vertical pieces, each 5' w x 15' h. The bottom of the opening can be up to two feet above the bottom of the silo and still be traversable by the excavator. Rigging points would be installed, two per slab, for holding the concrete pieces. The concrete would first be cut along the bottom and wedges installed, followed by three vertical cuts. Bracing would be installed on outer vertical cuts to brace the silo, while the center section is removed. The excavator, equipped with a hook for lifting, would be deployed and the rigging hung on the center section per the lift plan. The concrete would then be cut across all three sections at the top. The center concrete piece would be removed, using the excavator, placed to the side out of the way of the excavator and conveying equipment, and the rigging removed. The concrete would then be sprayed with encapsulant. Any material that spilled into the containment would be removed by a HEPA vacuum and/or the excavator. Rigging would then be hung on a side section, the bracing removed and the piece lifted and placed off to the side on top of the other piece. After spraying the concrete with encapsulant, rigging would be hung on the final section of concrete, the bracing removed and the piece lifted and placed to the side on top of the other pieces.

#### Retrieval Operations

Following completion of cutting open the silo, the excavator would be deployed to excavate the material. The excavator is equipped with a bin and conveyor, which would allow material to be scooped from the silo, dumped into the bin and conveyed to a hopper in the treatment enclosure.

An excavator will be sized to allow retrieval of material near the top of the silo, yet would be able to maneuver within the silo and remove material near the silo walls. The excavator must provide ample power to break up any bridged material and be large enough to be able to dig itself out, if it became buried under material. Following initial retrieval, the excavator would be remotely deployed into the silo and required to travel within the silo to retrieve the remaining material. The equipment could be set in a "precision work mode" and the operation of the equipment monitored by closed-circuit television to ensure that the excavator does not contact the silo walls. Retrieval operations would be remotely

controlled to the extent practical using CCTV systems mounted in the treatment enclosure. It is assumed that two cameras will be mounted on the excavator.

As a contingency, a Vecloader will also be available to vacuum material through the existing manways on the silo dome, if needed. This vacuum, equipped with an end effector, would allow the material in the center of the top third of the silo to be retrieved, thus reducing the volume of material in the silo to be retrieved by the excavator. Material retrieved by the Vecloader will be pneumatically conveyed to a hopper in the treatment enclosure. The Vecloader can also be used for housekeeping.

#### 1.1)2 Subtask #2 - Treatment

Once material is removed from Silo 3, it would be transferred to a hopper located in the treatment enclosure. The hopper would be equipped with a load cell weighing system, which provides an accurate indication of loss-in-weight for the bin's contents, ensuring the proper volume of Silo 3 material is conveyed to the batch mixer for treatment. The stabilization process requires that three solid powder materials (Silo 3 material, Envirobond™, and iron sulfate) be mixed thoroughly with water.

From the hopper, Silo 3 material would be fed by a conveyor into a batch mixer, where Envirobond™ and additives will be added to bind the constituents of concern. Stabilization of the Silo 3 material will be performed as a batch process and assumes use of a single rotor, 75-hp double-ribbon blender. The additives will be batched as well by dumping dry chemicals from either bulk bags (300+ lbs) or 50lb. paper bags into additives hopper and conveying to mixer. The estimate for this project assumes that the material will be provided in bulk bags, which will be dumped into a hopper and transferred to the batch mixer by screw conveyor, where the additives will be mixed with Silo 3 material. The addition of water into the mixer will be through a process water system, using three 1000-gallon tanks, to add either clean make-up water or recycled wash-water from building sumps or equipment wash down. The ribbon blender would be capable of completely mixing a batch size of 10 cubic yards – the volume of one Lift Liner™.

#### 1.1)3 Subtask #3 - Packaging & Preparation for Shipment

Following treatment, a screw conveyor will convey the treated material to a filling station located adjacent to the treatment area, where the material is prepared for packaging in Lift Liners™. The Lift Liners™ are 8' x 7'-2" x 5', 24,000 lb. containers to facilitate movement of Silo 3 material to the gondola rail cars and to facilitate handling at Envirocare. These containers are made of a woven polypropylene fabric shell with a water-resistant coating and a double layer polypropylene inner liner. Four flaps fold across the top of a full bag and are secured by tie-down straps of polyester webbing. Loading frames are used to support the Lift Liner as it is being filled. A modification of the liner (or and inner liner) will be made to allow cinching around a fill spout at the discharge of the mixer or conveyor at the discharge of the mixer and prevent spread of contamination onto the bag. [Assumptions P2, P5, P6].

To eliminate storage and double handling of containers, Lift Liners™ would be assembled on flatbed truck. Three loading frames would be placed on a flatbed truck, the bags inserted into the loading frames and folded open, with the flaps outside the loading frame. After inspection of the bags, the flatbed would transport the three Lift Liners™ to the filling station inside the treatment enclosure, where the packages would be filled to approximately 90% of volumetric capacity with the stabilized waste. Material would be conveyed from the mixer into the Lift Liner using a conveyor as discussed above.

Samples will be taken from the Lift Liners™ and used to verify WAC compliance. Sampling and analysis will be done by collecting grab samples from the 10 yd<sup>3</sup> waste packages. The grab samples representing one shipping unit such as a gondola car [T6] will be composited with other grab samples for final sample analysis. A description of the sampling assumptions is discussed later in this Section.

The waste production rate is driven by the requirement to meet loadout rates of 83,300 lb/day or 7.3 Lift Liners™ per loading day. The project operations schedule is based on 8.4 operating hours/day, 4 days/week. [Assumption OP2].

Once the Lift Liners™ have been filled and the samples taken, the flatbed would pull out of the filling area and the flaps of the container would be folded shut and secured. Radiological surveys would be taken and the flatbed truck would transport the Lift Liners™ to the existing rail spur at Track 12, where a mobile crane would be staged on the Haul Road. Gondola cars cannot be loaded in the rain. Therefore, three days worth of flatbed (8 flatbeds) will be secured to allow operations to continue in the event of rain. Lift Liners™ will be covered with tarps and the flatbeds staged in the Silos work zone during rain periods.

Prior to arrival of the Lift Liners at the rail loading area, a gondola car would be transported by WPRAP rail operators to the track 12 loading area. The crane would be used to remove the lid from the gondola car. The lid would be leased from IT and IT's lidding procedure will be used.

To load the Lift Liners into the gondola car, a lifting frame, designed specifically for use with the Lift Liner containers, would be attached to the lifting straps on the outer fabric shell for hoisting the container from the loading frame into the gondola cars. The packages would be transferred by crane and placed in gondola cars provided by WPRAP. After a gondola car had been loaded with seven containers, the lid would be replaced and the railcar would be moved to an outdoor holding area where it would remain for approximately one week, the estimated time necessary to complete final testing of the samples collected during container filling. At this point, the Silo 3 material is released for shipping. The gondola would be combined with the unit train for shipment. After the Lift Liners are removed from the flatbed, the flatbed and loading frames will be returned to the treatment process for reloading.

Gondola cars will not need to be weighed for shipment. The weight of the car will be determined by weighing individual Lift Liners using a scale attached to the crane, which loads the Lift Liners into the gondola.

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Upon laboratory verification that the treated Silo 3 material meets WAC and the applicable DOT requirements, the material would be released for shipment from site. Should the material fail to meet the WAC requirements, the Lift Liners™ would be shipped off-site for reprocessing at an off-site location. ~~a wet/dry vacuum, such as the Vee-loader, would be used to remove the material from the Lift Liners and the failed material would be re-introduced in to the treatment process.~~ No material will be shipped until laboratory analysis confirms compliance with the disposal facility WAC and DOT regulations.

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### Sampling and Analysis

Radiological, full-chemistry, target metals and geo-technical analyses will be conducted to verify WAC compliance. The following sampling protocol is assumed for the Silo 3 Project:

*Note:* When specified, composite samples of 3 bags/railcar result in only 1 sample for analysis.

- Radiological – To perform risk management, we will sample 3 bags per railcar and composite into 1 sample for analysis.  
*Note:* Envirocare performs gamma scan and FEMP-identified non-gamma emitter analysis on each of the first 10 railcars, then 1 in 5 afterwards.
- Full-Chemistry – To satisfy land disposal requirements (LDRs) and profile requirements, provide proof of process, and perform risk management, we will sample and analyze 3 bags per railcar for the first 10 railcars. (10 railcars x 3 bags/railcar = 30 samples) For the remaining 100 railcars, composite samples from 3 bags in every tenth railcar will be taken and analyzed. (100 remaining railcars ÷ 10 railcar interval = 10 railcars to be sampled)  
*Note:* E-care analysis on each of the first 10 railcars, then 1 in 10 afterwards.
- Target Metals - To perform risk management, and provide quality assurance checks of the efficiency/effectiveness of the treatment process, we will sample 3 bags per railcar for each railcar, and composite into 1 sample for analysis per railcar following the initial 10 railcars sampled and analyzed for full chemistry. (111 total railcars – 10 railcars initially sampled = 101 remaining railcars to be sampled)
- Geo-Technical - To satisfy LDRs and profile requirements, provide proof of process, and perform risk management, we will sample and analyze 3 bags per railcar for the first 10 railcars. (10 railcars x 3 bags/railcar = 30 samples) For the remaining 100 railcars, composite samples from 3 bags in every tenth railcar will be taken and analyzed. (100 remaining railcars ÷ 10 railcar interval = 10 railcars to be sampled)

Table 1-5.75 provides a summary of the expected analytical requirements for stabilized Silo 3 material for waste acceptance at Envirocare. It is assumed that these analyses will



be performed by the FEMP onsite laboratory. A turnaround time of 1 week will be required for target metals.

**TABLE 1-5.75**  
**SILO 3 ANALYTICAL REQUIREMENTS for ENVIROCARE WASTE ACCEPTANCE**

ACTIVITY DESCRIPTION	ANALYTE CLASS	ANALYSIS TYPES	TOTAL # ANALYSES	MATRIX	ESTIMATED COST FOR SUBCONTRACT
Radiological Analysis	Gamma Scan, Isotopic U/Th, Non-Gamma emitters	U-234, U-235, U-236, U-238, Th-230, Th-232, Ra-226, Ac-227, Pa-231	100 Analyses	Soil/ Soil-like	Performed on-site
Full-Chemistry Analysis	TCLP	8 Metals + Zinc	40 Analyses	Soil/ Soil-like	Performed on-site
		32 Organics,			\$20,676 [\$172.43 (volatiles) + \$344.47 (semi-volatiles)/ sample]
		Reactive Cyanides/Sulfides			\$1,466 (\$36.66/sample)
Target Metal Analysis	TCLP	As, Cd, Cr, Se	100 Analyses	Soil/ Soil-like	Performed on-site
Geotechnical Analysis	Method Driven	pH, PFLT, Proctor	40 Analyses	Soil/ Soil-like	Performed on-site

The analyses identified in Table 1-5.76 are assumed for industrial hygiene requirements during Silo 3 Operations. It is assumed that these samples will be analyzed on-site.

**TABLE 1-5.76**  
**ESTIMATED AIR SAMPLING REQUIREMENTS**

ANALYSIS	QUANTITY
Metals (Fumes/Particulates)	40
Organics	10
Particulates (Nuisance)	20
Silica	10
<b>TOTAL</b>	<b>80</b>

Table 1-5.77 identifies the water sampling requirements for the Silo 3 Project during Operations. It is assumed that these samples will be analyzed on-site.

**TABLE 1-5.77**  
**ESTIMATED WATER SAMPLING REQUIREMENTS**

ANALYSIS	QUANTITY
Water (AWWT WAC)	20 samples @ \$1,500/sample

1.1)4 Subtask #4 - Facility Ownership

The facility ownership scope of work includes maintenance, coordination, waste treatment, and operations for facility management services of the Silos area land, systems, structures, components and utilities. Routine facility ownership and maintenance tasks include:

- Routine grounds keeping activities;
- Daily walk throughs and inspections;
- Provide materials and perform maintenance;
- Provide for rental equipment and contracted services;
- Implement Lock and Tag procedure;
- Perform waste/storage/handling/transfer activities as necessary;
- Implement and update the K-65 Emergency Dome Failure Recovery Plan;
- Provide Silos project integration effort with site in regard to utilization;
- Water transfer activities form Pilot Plant to K-65 Trench;
- Maintain the decant sump and pump as needed;
- Maintain fencing and radiological postings/signs/ropes;
- Area access control;
- Preventative maintenance as required;
- Honeywell support;
- Miscellaneous Personal Protective Equipment;
- Bottled water;
- General housekeeping;
- Silt fencing installation and maintenance;

- Equipment calibration;
- Dumpsters and miscellaneous containers (55 gallon drums);
- Personnel moves and relocations.

#### 1.1)5 Subtask #5 - Utilities

DOE will pay utility costs for the Silo 3 remediation process. Utility costs for the Silo 3 Project are estimated in the PBS01 baseline.

#### Schedule

Removal and treatment of Silo 3 material is scheduled to be completed within 12 months. Performance for operations will be discrete quantity based. Performance will be measured based on tons of Silo 3 material treated. The total quantity to be treated is assumed to be 3,925 tons. Percent complete will be determined as follows:

$$\text{Percent complete} = \text{tons treated} / 3,925 \text{ tons total.}$$

#### 1.2) Quantification – Operations

#### Labor Resources

Operations will be conducted on one 10 hour shift, four days per week. The resources for Operations are summarized in Table 1-5.71. No overtime is planned for this activity.

**TABLE 1-5.71  
OPERATIONS RESOURCE SUMMARY**

R1- F07- 025	RESOURCE CODE	FTEs	COMMENTS
	BUYCON	1.0	Procure and manage delivery of operations supplies
	CHMOPR	8.0	Assume operate mixer, Vecloader, additives (projectized)
	CNSMGR	1.0	Project engineer support
	CRPNTR	0.3	Resource shared from division maintenance pool
	ELECTN	2.0	Resource shared from division maintenance pool
	ENGINR	1.0	Project Engineer Support CONOPS Engineer
	ENGPRC	2.0	System engineering support (Jacobs)
	ENSTEC	0.2	Sample documentation, data management in on-site lab
	FPRENG	0.1	Fire protection support
	HAZWAT	5.0 3.0	Assume close Lift Liners™, install gondola liners (projectized)
	HEOOPR	8.0	Assume operate excavator, yard truck, crane (projectized)
	INDHYG	0.5 0.3	IH support
	INSMEC	2.0	Resource shared from division maintenance pool
	LABCHM	1.0	Sample analysis in on-site lab

RESOURCE CODE	FTEs	COMMENTS
MCHNST	0.1	Maintenance on equipment
MILWRT	2.0	Resource shared from division maintenance pool
MNTMGR	1.5 <del>2.0</del>	Resource shared from division maintenance management
MNTREP	0.5	Revise maintenance work orders based on actual Operations changes
MVOOPR	2.0	Move additive bulk bags, operate fork trucks (projectized)
OILERM	0.1 <del>0.03</del>	Resource shared from division maintenance pool
OPRMGR	5.0 <del>4.0</del>	Operations Supervisor, <del>Transportation Supervisor</del> , Division Operations management
PAINTR	0.1 <del>0.03</del>	Resource shared from division maintenance pool
PIPFTR	2.0	Resource shared from division maintenance pool
PJSREP	1.6 <del>0.5</del>	Silos Division Maintenance management support (part-time), Transportation Supervisor
<del>PRJMGR</del>	<del>0.5</del>	<del>Silos Division Operations Manager support (part time)</del>
PROMGR	0.3	Silos Division Training Lead
QACENG	1.0	QA lead
RADENG	1.5	Radiological support
RADMGR	1.0	Radiological Supervisor from division
RADTEC	7.0 <del>4.0</del>	Radiological technician from division pool
RIGGER	2.0	Resource shared from division maintenance pool. Assume load Lift Liners™ onto crane.
S&HENG	1.0	S&H support (projectized)
TECWRT	0.2	Update procedures based on actual operations changes
TPSREP	2.0	Technical support for preparing data packages, managing documentation
TRNLAB	2.0	Resource shared from division maintenance pool. Assume cover Lift Liners™ on flatbed.
<del>TRNREP</del>	<del>0.2</del>	<del>Train replacement personnel on project</del>
WELDER	0.5	Resource shared from division maintenance pool
WSTENG	0.5	WAO support
<del>WSTMGR</del>		

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In addition to these labor resources, which have been included in the Silo 3 baseline, there are several centralized resources, which will be utilized during Operations, but have not been included in the baseline. These include: ECDC support, a general laborer, industrial mechanic, porter, laundry, store room attendants, the dioctyl phthalate (DOP) crew, and safety analysis support.

#### Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Operations are identified in Table 1-5.72.

**TABLE 1-5.72**  
**MATERIALS, ODCS, AND SUBCONTRACTS – OPERATIONS**

ITEM	DESCRIPTION/BASIS	COST
Materials	Remaining Ops Equipment (see Table 1-5.73)	\$832,650
	PPE (see Table 1-5.74)	\$92,000
ODCs	None	---
Subcontracts	IT (leasing railcar lids)	\$3,966
	Off-site Lab Work	\$22,142
	Coleman (CONOPs support)	\$161,088

Table 1-5.73 provides the remaining equipment anticipated to be procured by Fluor Fernald for operations:

**TABLE 1-5.73  
 REMAINING OPERATIONS EQUIPMENT**

ITEM	PRICE/ UNIT	UNITS	ESTIMATED COST	TYPICAL SUPPLIER	NOTES
HEPA Filters	\$500/ filter	240	\$120,000	Ketchum & Walton	Engineering estimate
Pins/chains for concrete removal			\$0		Engineering estimate
Sampling Equipment (jars, etc.)			\$200,000		Engineering estimate
Herculite	\$225/roll	10	\$2,250		Engineering estimate
Decontamination Equipment (rad spray, towels, pads)			\$5,000		Engineering estimate
Envirobond			\$0	RMRS	Free per settlement
Ferrous Sulfate			\$200,000		Engineering estimate
Supersaks	\$500	350	\$175,000	Transport Plastics	Vendor quote
Inner Liners					
Lift Liner Loading Frames	\$200/ frame per month	18	\$39,600		Vendor quote - 11 month rental
Railcar Liners	\$198/ liner	100	\$19,800		WPRAP estimate
Fixative (silo decontamination)			\$25,000		Engineering estimate
<b>TOTAL</b>			<b>\$832,650</b>		

Table 1-5.74 provides the anticipated PPE to be procured during operations.

**TABLE 1-5.74  
 PERSONAL PROTECTIVE EQUIPMENT**

ITEM	PRICE/ UNIT	UNITS	ESTIMATED COST	TYPICAL SUPPLIER	NOTES
Tyvek Coverall Units	\$4/unit	11500	\$46,000		ARAMSCO pricing manual 50 units/day @ 230 days
Rubber Booties (Model 10241)	\$4/unit	11500	\$46,000		ARAMSCO pricing manual 50 units/day @ 230 days (assuming 12 individuals)
<b>TOTAL</b>			<b>\$92,000</b>		

PAPRs and Bubblesuits required for operations, were procured during startup.

#### 1.5.7 HS3AG - Shipping

The shipping scope of work includes:

- manifesting the waste;
- shipping the material to Envirocare;
- disposal of treated Silo 3 material; and
- disposal of secondary waste.

##### 1) Task # 1 – Shipping

##### 1.1) Plan/Scope - Shipping

Fluor Fernald will prepare the manifests for shipments and dispose of secondary waste; IT will ship the material; and DOE will be responsible for the disposal of the Silo 3 waste at Envirocare.

The following parameters are used for the shipping of Silo 3 material on the unit train:

1. Unit train capable of carrying up to 60 cars
2. Gondola cars are 630" x 114" x 66"
3. Gondola maximum weight = 286,000 lbs

4. Gondola tare weight = 66,000
5. Lid tare weight = 560 lbs

No more than five gondola cars per unit train will be dedicated to Silo 3. Unit trains are shipped once every 2.5 weeks.

1.1)1 Subtask #1 - Manifesting

Administration of the rail shipment program remains part of the WPRAP operations. Documentation, such as manifests and placards, required to ship Silo 3 railcars as part of the unit train, will be prepared by Fluor Fernald under the existing WPRAP program.

1.1)2 Subtask #2 - Rail Shipment

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Rail shipment activities will be conducted according to procedures and plans already in place at WPRAP. The Silo 3-dedicated gondola cars will be added to the unit train and shipped via the CSX rail tender. In order to meet the WPRAP shipping operation schedule and taken advantage of the existing rail shipment infrastructure, shipments of Silo 3 material must be complete by ~~January February 2005~~ ~~October 2004~~.

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Silo 3 material is classified by DOT as LSA-II material as defined in 49 CFR 173.403. Silo 3 material, both untreated and treated, must be transported in a container that meets the DOT design criteria for an Industrial Package Type 2 (IP-2) container (49 CFR 173.411 (b)(2)) and the disposal facility. Neither the Lift Liners™, nor the gondola cars used for shipment of Silo 3 material are IP-2 containers. Therefore, an exemption to package and transport the Silo 3 material in gondola cars will have to be obtained. This exemption is being pursued under the WPRAP scope of work.

Assumed costs for shipment are provided in the assumptions of the Narrative (Section 1) of this Closure Plan.

Schedule

Performance against shipment will be measured based on the number of railcars shipped.

Percent complete = Cars shipped/100 cars total

1.2) Quantification – Shipping

Labor Resources

The resources to support shipping are not included in the Silo 3 baseline, these are covered under WPRAP.



Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Shipping are identified in Table 1-5.78.

**TABLE 1-5.78  
 MATERIALS, ODCS, AND SUBCONTRACTS – SHIPPING**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	Shipping (100 railcars @ \$9,406/ rail car)	\$940,600
Subcontracts	None	---

2) Task #2 - Disposal

2.1) Plan/Scope – Disposal

The scope of the Disposal activity involves the proper disposition of treated Silo 3 material at Envirocare. In addition, the scope of this activity includes proper disposition of secondary waste and safe shutdown waste.

2.1)1 Subtask #1 - Disposal of Treated Silo 3 Material

Silo 3 material will be disposed at Envirocare of Utah under the Army Corp of Engineers contract. The DOE will obtain an interagency agreement with the Corps of Engineers and accomplish all necessary negotiations with the Corp of Engineers to allow use of the Corps contract.

Silo 3 material will be disposed of in either the LLW or 11e(2) cell at Envirocare, in accordance with NRC license requirements. Assumed costs for disposal, which will be paid by DOE, are provided in the Narrative (Section 1) of this Closure Plan, as well as the estimated quantity of material to be disposed of.

2.1)2 Subtask #2 - Disposal of Secondary Waste

Secondary waste, such as PPE and HEPA filters will be generated as a result of the treatment process. PPE and other secondary waste that does not contain Silo 3 residues will be disposed in the OSDF. It is estimated that 30 roll-off boxes (ROBs) of secondary waste will be destined for the OSDF. Two ROBs will be recirculated for disposal of secondary waste.

Secondary waste containing Silo 3 residues, such as HEPA filters, will be disposed at Envirocare with the Silo 3 material.

### Schedule

Disposal is scheduled to begin with the start of operations and will end with the completion of the operations subtask.

#### 2.2) Quantification – Disposal

### Labor Resources

The resources for completing Disposal are not included in the Silo 3 baseline. These costs will be assumed by DOE.

### Materials, ODCs, and Subcontracts

Table 1-2.4 identifies the estimated cost of disposal of Silo 3 material at Envirocare.

#### 1.5.8 HS3AH - Shutdown

Fluor Fernald will perform shutdown activities to place the Silo 3 remediation and support facilities in a controlled state ready for dismantlement, in accordance with the FEMP Collective Bargaining Agreement with the FAT&LC. FAT&LC personnel will be used to isolate all utilities to the facilities, remove gross quantities of hold-up from existing equipment, ductwork, pipes, and sumps, and perform gross decontamination to prepare for dismantlement.

The Shutdown task includes the following two subtasks:

- Safe Shutdown Documentation
- Safe Shutdown

#### 1) Task #1 - Safe Shutdown Documentation

##### 1.1) Plan/Scope - Safe Shutdown Documentation

The Silo 3 team will prepare a Facility Shutdown Work Plan, which will guide the facility shutdown activities. The Facility Shutdown Work Plan will describe the methods for safe shutdown of facilities in preparing them for D&D. The Facility Shutdown Work Plan will include, but not be limited to, the following information:

- Energy Isolation Plan;
- Establishing Temporary Utilities;
- State the type and location of temporary utilities; and
- State the methods to be used to tie-in to portable utilities ensuring applicable code compliance.

- Removal of Hold-Up Plan
- Identify, characterize, locate, and quantify hold-up material;
- Define the system to be worked;
- Identify the specific point(s) of entry;
- Identify use of secondary containments at each point where the system is opened;
- Identify final storage locations for containerized waste; and
- Identify removal, management, and treatment procedures for hold-up material estimated to have a volume greater than one quart.
- Gross Decontamination Plan

### Schedule

The Safe Shutdown Documentation subtask will begin during Operations and will be completed prior to the start of Safe Shutdown.

#### 1.2) Quantification - Safe Shutdown Documentation

### Labor Resources

The labor resources to complete Safe Shutdown Documentation are included under the Safe Shutdown subtask. No overtime is planned for this activity.

### Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Safe Shutdown Documentation are identified in Table 1-5.79.

**TABLE 1-5.79  
 MATERIALS, ODCS, AND SUBCONTRACTS – SAFE SHUTDOWN DOCUMENTATION**

ITEM	DESCRIPTION/BASIS	COST
Materials	None	---
ODCs	None	---
Subcontracts	None	---

#### 2) Task #2 - Safe Shutdown

##### 2.1) Plan/Scope - Safe Shutdown

The primary purpose of safe shutdown is to isolate all utilities to the facilities, remove gross quantities of hold-up from existing equipment, ductwork, pipes, and perform gross decontamination to prepare for dismantlement. Dismantlement of the Silo 3 facility, equipment and silo will be the responsibility of the Silos 1 and 2 Project. The scope of facilities requiring shutdown for the Silo 3 Project include trailers supporting the Silo 3

Project and the Silo 3 facility constructed to support the retrieval and treatment of the Silo 3 material.

The analyses identified in Table 1-5.80 are assumed for industrial hygiene requirements during Silo 3 Safe Shutdown. It is assumed that these analyses will be performed on-site using FEMP labor.

**TABLE 1-5.80  
ESTIMATED AIR SAMPLE ANALYSES**

ANALYSIS	QUANTITY
Metals (Fumes/Particulates)	20
Organics	0
Particulates (Nuisance)	10
Silica	0
<b>TOTAL</b>	<b>30</b>

The Safe Shutdown activities will include the following:

- Isolation of Utilities
- Establishment of Temporary Utilities
- Removal of Hold-up Material
- Gross Decontamination
- Treatment of Hold-Up Material
- Facility Shutdown

**2.1)1 Subtask #1 - Isolation of Utilities**

Fluor Fernald will isolate all utilities, including, but not limited to, electric power, steam, waster and compressed air from the Silo 3 facility. Fluor Fernald will develop an Energy Isolation Plan within the Facility Shutdown Plan that describes when, where, and how the utilities will be isolated.

Utilities will be safely disconnected outside the facility early in the facility shutdown process, by physically cutting, air gapping, and tagging the lines. Fluor Fernald will remove all grounding conductors to grade level. Fluor Fernald will verify that all utilities are capped and/or controlled and notify the AEDO of the completion of utility isolation.

**2.1)2 Subtask #2 - Establishment of Temporary Utilities**

Fluor Fernald will be responsible for the following:

- Extending the power from the point source location or provide portable generators;

- All electrical appurtenances required for temporary power shall be in accordance with the NEC;
- Temporary heating or cooling, if needed, will be provided. All portable heaters will be UL listed or American Gas Association (AGA) certified for their intended use and not modified for other applications. Ventilation for fuel-fired heaters and adequate clearance to combustible materials, surfaces, and furnishings shall be provided according to manufacturer's recommendations. Use of Liquid Propane Gas (LPG) gas-fired heaters will be approved by the FEMP Fire Protection group. All portable continuous running of gas-fired heating systems require 24-hour coverage by the project; and
- Extend the water from the point source location to support operations.

#### 2.1)3 Subtask #3 - Removal of Hold-Up Material

The interior of all equipment, piping, ductwork, tanks, and sumps will be assessed to determine whether they contain loose and/or visible hold-up material. Loose is defined as material that is considered releasable through a credible accident. If the item contains loose or visible material, the material shall be removed in accordance with FEMP-approved Safe Work Plans and properly treated and packaged for disposal.

#### 2.1)4 Subtask #4 - Gross Decontamination

Fluor Fernald will perform gross decontamination of the remaining equipment and the interior of the facility. Gross decontamination includes general housekeeping to remove contaminated debris, vacuuming loose dust, wet wiping equipment, ductwork, piping, and the interior of the structure walls, and removing loose, visible residues.

#### 2.1)5 Subtask #5 - Treatment of Hold-Up Material

It is assumed that the removal of hold-up material will be logically planned so that the material can be flushed and transferred into a final batch in the mixer before the equipment is disconnected.

#### 2.1)6 Subtask #6 - Facility Shutdown

The Facility Shutdown activities performed by Fluor Fernald will include:

- Removal and treatment of hold-up material from all equipment, piping, ductwork, tanks, and sumps, as required to meet the OSDF WAC.
- Removal of contamination on equipment, materials or debris using methods that minimize the generation of secondary waste.

- Flushing of all process equipment and support systems to remove loose contaminants and process residues. Equipment and systems will be drained and dried in preparation for dismantlement. Wastewater will be collected, staged, sampled, and treated, as necessary to meet the discharge requirements of the AWWT facility prior to discharge to the AWWT. Sampling and analysis activities will be performed on wastewater to verify compliance with the AWWT discharge requirements.
- Isolation of utilities supporting the remediation and support equipment, systems, etc.
- Establishment of temporary utilities to support dismantlement
- Excessing of trailers, furniture, etc.

### Schedule

Safe Shutdown activities will begin immediately following the completion of Operations and the completion of the Facility Shutdown Documentation.

### 2.2) Quantification - Safe Shutdown

### Labor Resources

The resources for Safe Shutdown are summarized in Table 1-5.81. No overtime is planned for this activity.

**TABLE 1-5.81  
SAFE SHUTDOWN RESOURCE SUMMARY**

RESOURCE CODE	FTEs	COMMENTS
CHMOPR	8.0 5.0	Assume operate mixer, Vecloader, additives (projectized)
CNSMGR	1.0	Project Engineering input
CRPNTR	0.3	Resource shared from division maintenance pool
ELECTN	2.0	Resource shared from division maintenance pool
ENGINR	1.0	Project Engineering support
ENGPRC	2.0	Systems engineering input (Jacobs)
ENSTEC	0.2	Sample documentation, data management in on-site lab
FPRENG	0.1	Fire protection support
HAZWAT	5.0	Assume close Lift Liners™, install gondola liners (projectized)
HEOOPR	8.0 7.0	Assume operate excavator, yard truck, crane (projectized)
INDHYG	0.4 0.3	IH support
INSMEC	2.0	Resource shared from division maintenance pool
LABCHM	1.0	Sample analysis in on-site lab
MCHNST	0.1	Maintenance on equipment
MILWRT	3.0 4.0	Resource shared from division maintenance pool

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RESOURCE CODE	FTEs	COMMENTS
MNTMGR	1.0 <del>2.0</del>	Resource shared from division maintenance management
MNTREP	1.0 <del>0.5</del>	<del>Revise</del> Prepare maintenance work orders based on actual Operations changes
MVOOPR	2.0	<del>Move additive bulk bags,</del> operate fork trucks (projectized)
OILERM	0.1 <del>0.03</del>	Resource shared from division maintenance pool
OPRMGR	2.0 <del>4.0</del>	Operations Supervisor, <del>Transportation Supervisor,</del> Division operations management
PAINTR	0.1 <del>0.03</del>	Resource shared from division maintenance pool
PIPFTR	2.0	Resource shared from division maintenance pool
PJSREP	1.6 <del>0.5</del>	Division Maintenance Management support (part-time), Transportation Supervisor
PRJMGR	0.5	<del>Silos Division Operations Manager (part time)</del>
QACENG	1.0	QA lead
RADMGR	1.0	Radiological Supervisor from division
RADTEC	7.0 <del>4.0</del>	Radiological technician from division pool
RIGGER	2.0	Resource shared from division maintenance pool. Assume lead Lift Liners™ onto crane.
S&HENG	1.0	S&H support (projectized)
TPSREP	2.0	Technical support for preparing Safe Shutdown documentation
TRNLAB	2.0	Resource shared from division maintenance pool. Assume cover Lift Liners™ on flatbed.
WELDER	0.5	Resource shared from division maintenance pool
WSTMGR	0.5	WAO support

In addition to these labor resources, which have been included in the Silo 3 baseline, there are several centralized resources, which will utilized during Safe Shutdown, but have not been included in the baseline. These include: ECDC support, a general laborer, industrial mechanic, porter, laundry, store room attendants, the dioctyl phthalate (DOP) crew, and safety analysis support.

#### Materials, ODCs, and Subcontracts

The materials, ODCs, and subcontracts for Safe Shutdown are identified in Table 1-5.82.

**TABLE 1-5.82  
MATERIALS, ODCS, AND SUBCONTRACTS – SAFE SHUTDOWN**

ITEM	DESCRIPTION/BASIS	COST
Materials	Containers	\$10,000
ODCs	None	---
Subcontracts	None	---





## APPENDIX A – SILO 3 MATERIAL DATA

TABLE A-1  
SUMMARY OF CHEMICAL ANALYSES FOR SILO 3 MATERIAL<sup>1</sup>

Element	Approximate Mean (mg/kg)	Upper 95% Confidence Mean (mg/kg)	Range of Detection (mg/kg)
Aluminum	17,200	19,800	10,800 - 23,700
Arsenic	1,950	3,170	532 - 6,380
Barium	217	278	118 - 332
Beryllium	24.2	29.1	10-39.9
Cadmium	60	94	21.5 - 204
Calcium	29,400	33,400	21,300 - 39,900
Chromium	288	395	139-560
Cobalt	2,100	2,890	1,100-3,520
Copper	2,550	3,340	1,610-7,060
Iron	37,800	52,200	13,900 - 67,600
Lead	1,730	2,380	646 -4,430
Magnesium	58,600	68,900	38,200-80,900
Manganese	4,380	5,160	2,420-6,500
Mercury	0.4	0.7	0.3-0.69
Nickel	3,150	4,290	1,760-6,170
Potassium	7,260	14,000	1,300-22,800
Selenium	174	229	101 - 349
Silver	16	18	9.2-23.8
Sodium	36,100	40,800	22,900 - 51,700
Thallium	21	56	4-73.9
Vanadium	1,820	3,490	418-4,550
Zinc	450	535	301-672

<sup>1</sup> Data taken from Table 4-20 of the Remedial Investigation Report for Operable Unit 4.

**TABLE A-2**  
**SILO 3 PROJECT TCLP DATA**

**December 2000 - SSWR Data**

	TCLP Extraction and Acid Digestion (mg/L) Sample #1	TCLP Extraction and Acid Digestion (mg/L) Sample #2	Regulatory Level (mg/L)
As			
#200339189	<0.194	<0.194	5
#200339266	<0.194	0.462	5
#200339267	<0.194	<0.194	5
Ba			
#200339189	0.195	0.217	100
#200339266	0.316	0.321	100
#200339267	0.300	0.302	100
Cd			
#200339189	<0.04	0.017	1
#200339266	0.034	0.054	1
#200339267	0.028	0.029	1
Cr			
#200339189	12.2	7.93	5
#200339266	8.7	9.12	5
#200339267	8.43	8.32	5
Hg			
#200339189	<0.0004	<0.0004	0.2
#200339266	<0.0004	<0.0004	0.2
#200339267	<0.0004	<0.0004	0.2
Pb			
#200339189	<0.012	<0.031	5
#200339266	<0.031	0.354	5
#200339267	<0.031	0.354	5
Se			
#200339189	1.06(gfaa) 1.09	1.2(gfaa) 1.16	1
#200339266	1.18(gfaa) 1.23	1.28(gfaa) 1.74	1
#200339267	1.2(gfaa) 0.97	1.1(gfaa) 0.91	1
Ag			
#200339189	<0.015	<0.015	5
#200339266	<0.015	0.036	5
#200339267	<0.015	<0.015	5

## RMRS Treatability Study

- Pretreatment TCLP tests indicated that only Cr and Se will leach above TCLP limits.

<u>Metals</u>	Untreated Waste Total Metals ppm	Untreated Waste Lab #1 TCLP ppm	Untreated Waste Lab #2 TCLP ppm	Regulatory Levels (mg/L)
As	1460	0.5	0.168 U	5
Ba	159		0.301	100
Cd	6	0.18	0.01 U	1
Cr	449	6.88	13	5
Pb	628		0.121 U	5
Hg	<0.1		0.004 U	0.2
Se	59	1	1.95	1
Ag	0.09		0.024 U	5
Moisture Content	3 wt. %	3 wt. %	3 wt. %	

## NFS Treatability Study Data – June, 1997

- Conducted with remaining RI/FS samples
- Only chromium exceeds TCLP

	TCLP Metals (ppm)	Regulatory Level (mg/L)
Ag	<0.002	5
As	0.194	5
Ba	0.269	100
Cd	0.004	1
Cr	6.055	5
Hg	<0.01	0.2
Pb	<0.02	5
Se	0.623	1

### OU4 1989 Silo 3 HSL EP Toxicity Results

Values shown in mg/L

[illegible]

**TABLE A-3**  
**TCLP RADIOLOGICAL ANALYSES FOR SILO 3 MATERIAL<sup>1</sup>**

Radiochemical Parameters	Concentration (pCi/L)
Actinium-227	5.54 ± 1.94
Gross alpha	3,150 ± 830
Gross beta	670 ± 340
Lead-210	87.1 ± 9.2
Polonium-210	245 ± 110
Protactinium-231	< 647
Radium-226	2,455 ± 558
Radium-228	< 110
Thorium-228	3.17 ± 1.42
Thorium-230	10.4 ± 2.8
Thorium-232	< 1
Uranium-234	92.2 ± 13.8
Uranium-235/236	5.09 ± 1.59
Uranium-238	86 ± 13

<sup>1</sup> Data taken from Table 4-22 of the Remedial Investigation Report for OU4.

**Table A-4**  
**SUMMARY OF RADIONUCLIDE ANALYSES FOR SILO 3 MATERIAL<sup>1</sup>**

Radionuclide	Sample 1	Sample 2	Range
Actinium-227	618	925	234 - 1,363
Lead-210	2,620	3,480	454 - 6,427
Protactinium-231	487	627	266 - 931
Radium-224	290	367	64 - 453
Radium-226	2,970	3,870	467 - 6,435
Radium-228	297	406	82 - 559
Thorium-228	590	747	459 - 996
Thorium-230	51,200	60,200	21,010 - 71,650
Thorium-232	656	842	411 - 1,451
Uranium-234	1,480	1,730	348 - 1,935
Uranium-235/236	93.6	117	42 - 158
Uranium-238	1,500	1,780	320 - 2,043

<sup>1</sup> Data taken from Table 4-19 of the Remedial Investigation Report for OU4.



## APPENDIX B – SILO 3 DOCUMENTS AND DELIVERABLES

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### PROJECT MANAGEMENT

~~Project Execution Plan~~  
~~Training & Qualification Plan~~  
Project Closure Plan

### REMEDIAL DESIGN

~~Design Data Development Bench Scale Test Work Plan~~  
~~Design Data Development Bench Scale Tests~~  
~~Design Data Development Bench Scale Test Report~~  
Design Basis and Requirements Document  
Conceptual Design Package  
Remedial Design Package  
~~Preliminary Engineering Design Package (Preliminary)~~  
~~Final Engineering Design Package (Final)~~  
Structural Evaluation  
Container Selection  
Performance Grading  
Process Description  
Retrieval Technology Description  
~~Process and Mechanical Flow Diagrams/Mass Balance~~  
~~Heat and Material Balances~~  
Piping and Instrumentation Diagrams  
~~Layout/ General Arrangement Drawings~~  
Electrical Single Line Diagrams  
Site Plot Plans  
Erosion/Drainage Control Drawings  
Grading, Drainage, and Paving Plans  
HVAC Flow and Control Diagrams  
Control System Block Diagrams  
Radiological Zone Drawings  
Underground Piping Drawings  
Control Room Arrangements  
Lightning Protection and Grounding Design  
List of Drawings, Specifications, and Other Documents  
Data Sheets and Draft Specifications  
Electrical Load Summary  
Tie-In/List  
Motor List  
Line List  
Valve List  
Equipment List  
Instrument List  
Instrument Data Sheets  
Instrument Installation Details

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Instrument Loop Diagrams  
Key Calculations  
~~Equipment Specifications~~  
~~Piping Arrangements/ISOs~~  
Civil Utility Plans Drawings  
Preliminary Structural Steel Design and Drawings  
Preliminary Concrete Design and Drawings  
Construction Cost Estimate and Schedule/Assessment of Design to Cost  
Long Lead Procurement Specifications  
Software Programming  
Procurement of Long Lead Equipment  
Equipment Procurement  
Equipment Inspection and Tests During Fabrication  
Process Control Plan  
Sampling and Analysis Plan  
~~Operational~~ Environmental Control Plan  
Transportation and Disposal Plan  
Silo 3 Gross Decontamination Plan  
ARARs Compliance Strategy  
Contingency Plan  
Health and Safety Controls  
Environmental Monitoring Plan  
Preliminary Hazard Analysis Report  
Hazard Category Calculations  
Accident Analysis  
ALARA Analysis  
Integrated Hazard Analysis  
Fire Hazard Analysis  
Human Factors Evaluation  
Health and Safety Plan/PSHSRM  
Design Change Notices  
Requests for Information  
Unreviewed Safety Questions  
CSX Contract Modification  
IT Contract Modification

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~~Silo 3 WAC (for Fissile Compounds)~~

## CONSTRUCTION MANAGEMENT

IFB/RFP  
Safe Work Plans  
Quality Evaluation Plans (or SIPs)  
Turnover Plan  
Contractor Submittal Register  
Scope of Work  
Pay-Item Description  
Final Construction Estimates  
PWID  
Government Estimate



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Contract  
Baseline  
Permits  
Contract Modifications  
QA Surveillances and Assessments  
Equipment Receipt Inspections  
Field Inspections  
Progress Reports  
Redlines  
As-Builts  
Construction Acceptance Test Plan

### **SUBCONTRACTS**

Installation of Civil and Structural Work  
Erection of Containment Facilities  
Mechanical Work  
Electrical and Instrumentation Work

### **STARTUP/STARTUP REVIEW**

CONOPs Matrix  
Standing Orders  
Readiness Plan  
Readiness Plan of Action (POA)  
Readiness Implementation Plan (RIP)  
Operating Procedures – Silo 3-specific  
    Operation of Excavator  
    Operation of Vecloader  
    Operation of HEPA Ventilation System  
    Operation of Mixing System/Conveyors/Additive System  
    Operation of Breathing Air System  
    Operation of CCTV System  
    Loading of Lift Liners™  
    Transport of Materials to Rail Facility  
    Movement of Gondola Car on Silo 3 Track  
    Emergency Operating Procedure  
    System Shutdown (short duration)  
    Decontamination (including tools and equipment)

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~~Operating Procedures – Fissile compounds specific~~  
~~Loading and Operation of Shredder~~  
~~Operation of Magnetic Separator~~  
~~Mixer Clean out~~

Lift Plans  
Final Hazard Analysis Report  
Hazard Category Calculations  
Accident Analysis  
ALARA Analysis

Integrated Hazard Analysis

Fire Hazard Analysis

Human Factors Evaluation

Maintenance Plan

Lesson Plans/Briefings – Silo 3 specific

Mixing System/Conveyor Operation

Vecloader Operation

Excavator Operation

HEPA Ventilation System Operation

Air-supplied Respirator Operation

Breathing Air System Operation

CCTV System Operation

Packaging

Emergency Response

Standing Orders

Safety Basis

~~Lesson Plans/Briefings – Fissile compounds specific~~

~~Shredder Loading and Operation~~

~~Mixer Clean Out~~

~~Magnetic Separator Operation~~

SOT Plan

SOT Procedures – Silo 3 specific

Retrieval System

Additives System

Batch Mixing & Filling System

HEPA System

Breathing Air System

~~SOT Procedures – Fissile compound specific~~

~~Shredder System~~

SOT Final Test Report

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## **REMEDIAL ACTION**

Sampling Data

## **SHIPPING**

Manifesting

## **SHUTDOWN**

Decontamination Plan

Facility Shutdown Work Plan

## APPENDIX C - SILO 3 PROJECT FUNCTIONAL AREA DOCUMENTS

In addition to Fernald Closure Contract DE-AC24-01OH20115, the majority of the Functional Area Documents used in the conduct of Silo 3 Project planning and work are listed below. Project-specific documents are identified in Appendix B.

FUNCTIONAL AREA	SILO 3 PROJECT FUNCTIONAL AREA DOCUMENTS
Management Systems	<p>RM-0016, MANAGEMENT PLAN (REV. 42)</p> <p>RM-0022, RECORDS MANAGEMENT PROGRAM (REV. 3)</p> <p>RM-0046, VITAL RECORDS/RECORDS DISASTER RECOVERY REQUIREMENTS MANUAL (REV. 1)</p> <p>RM-0052, FUNCTIONAL AREA AND DIVISION DOCUMENT REQUIREMENTS (REV. 3, UDC 1)</p> <p>D10-00-028, PSS DIVISION PROJECT/PROGRAM SPECIFIC DOCUMENT PROGRAM (REV. 0)</p> <p>PL-3058, THE FEMP COMPUTER SOFTWARE MANAGEMENT PLAN (REV. 2)</p> <p>PL-3059, FLUOR FERNALD ENHANCED WORK PLANNING (EWP) PROGRAM DESCRIPTION AND IMPLEMENTATION PLAN (REV. 4)</p> <p>PL-3085, INFORMATION MANAGEMENT DISASTER RECOVERY PLAN (REV. 1)</p> <p>ACR-001, CONTRACT SUBMITTAL REQUIREMENTS (REV. 10)</p> <p>MS-0006, MAINTENANCE OF STANDARDS/REQUIREMENT IDENTIFICATION DOCUMENT (S/RID) (REV. 5)</p> <p>MS-0010, SELF ASSESSMENT OF FLUOR DANIEL FERNALD REQUIREMENTS (REV. 4)</p> <p>MS-1003, ALIGNMENT PROCESS (REV. 2)</p> <p>MS-1004, ESTABLISHING AN INDEPENDENT SAFETY REVIEW COMMITTEE (ISRC) AND CONDUCTING INDEPENDENT SAFETY REVIEWS (REV. 3)</p> <p>MS-1005, FLUOR DANIEL SITEWIDE COMMITMENT TRACKING SYSTEM (CTS) (REV. 3)</p> <p>MS-1007, TECHNICAL INFORMATION APPROVAL AND DISSEMINATION (REV. 2)</p> <p>MS-1008, IDENTIFYING, REPORTING, AND TRACKING PRICE-ANDERSON AMMENDMENTS ACT NONCOMPLIANCES (REV. 7)</p> <p>MS-1010, ARRANGING A VIDEO TELECONFERENCE (REV. 2)</p> <p>MS-1011, ACQUISITION OF COMPUTING RESOURCES (REV. 2)</p> <p>MS-1012, ESTABLISHING AND TERMINATING COMPUTER USER ACCOUNTS (REV. 2)</p> <p>MS-1013, MANAGEMENT OF OFF-THE-SHELF SOFTWARE (REV. 2)</p> <p>MS-1014, PROTECTION AGAINST COMPUTER VIRUSES (REV. 2)</p> <p>MS-1015, REQUESTING IM SERVICES (REV. 3)</p> <p>MS-1016, REQUESTING A TELEPHONE AND TELEPHONE STANDARDS AT THE FEMP (REV. 2)</p> <p>MS-1021, PROJECT MANAGEMENT (REV. 3)</p> <p>MS-1027, LABORATORY BUILDING WORK PLANNING AND MANAGEMENT (REV. 1)</p> <p>MS-1028, TECHNICAL REVIEW BOARD (TRB) (REV. 1)</p> <p>MS-1030, REPORTING SIGNIFICANT UNCLASSIFIED COMPUTER SECURITY INCIDENTS (REV. 1)</p> <p>MS-1031, SOFTWARE VERIFICATION AND VALIDATION REVIEW (REV. 1)</p> <p>MS-1034, CHEMICAL ACCOUNTABILITY (REV. 2)</p> <p>MS-1035, REQUISITIONING MATERIALS THROUGH THE TECHNICAL INFORMATION CENTER (TIC) (REV. 0)</p>

FUNCTIONAL AREA	SILO 3 PROJECT FUNCTIONAL AREA DOCUMENTS
Management Systems (Cont.)	MS-1036, DISPOSING CONTAMINATED VERSIONS OF RECORDS COPIED (REV. 0) MS-1037, GENERAL HANDLING AND FILING OF RECORDS (REV. 1) MS-2001, FUNCTIONAL AREA DOCUMENT PROGRAM (REV. 6) MS-2002, FLUOR DANIEL FERNALD FORMS PROGRAM (REV. 1) 40000-PL-0008, SILOS PROJECT DIVISION RECORDS MANAGEMENT PLAN (REV. 1) 40400-PEP-0001, SILO 3 PROJECT, PROJECT EXECUTION PLAN (REV. 6)
Public Involvement	IN SUPPORT OF THE SILO 3 PROJECT, SITE PROCEDURES COVERING PUBLIC INVOLVEMENT ARE IMPLEMENTED THROUGH THE SUPPORT OF A PUBLIC AFFAIRS REPRESENTATIVE. PI-0002, VISITOR TOUR ACCESS (REV. 1) PI-0004, RESPONSE TO PUBLIC INFORMATION REQUESTS (REV. 1) PI-0006, FLUOR DANIEL FERNALD (FDF) LOGO PROCEDURE (REV. 0) PI-0007, AUDIOVISUAL AND EXHIBIT MANAGEMENT (REV. 1) PI-0008, JOINT INFORMATION CENTER (REV. 1) PI-0009, INTRANET AND INTERNET MANAGEMENT (REV. 0) 40000-PL-0009, COMMUNICATION PLAN FERNALD SILOS PROJECT OPERABLE UNIT 4 (REV. 5)
Financial Management/ Project Controls	FM-0004, MONTH-END CLOSING PROCEDURE (REV. 2) FM-0005, COMPLETION OF A TIMESHEET (REV. 7) FM-0006, EXPENSE REPORT PREPARATION (REV. 3) FM-0007, FLUOR DANIEL FERNALD DISBURSEMENT SIGNATURE AUTHORIZATION PROCEDURE (REV. 4) FM-0009, NON-REIMBURSABLE COST (REV. 0) FM-0010, DISTRIBUTION OF PAYCHECKS AND DIRECT DEPOSITS (REV. 1) PCS-001, WORK DEFINITION (REV. 4) PCS-002, COST ESTIMATING (REV. 4) PCS-003, PLANNING AND SCHEDULING (REV. 6) PCS-006, FUNDS MANAGEMENT (REV. 5) PCS-007, FINANCIAL OBLIGATION MANAGEMENT (REV. 4) PCS-008, WORK AUTHORIZATION (REV. 5) PCS-009, PERFORMANCE MEASUREMENT REPORTING (REV. 4) PCS-010, SUBCONTRACT AND MATERIALS PERFORMANCE MEASUREMENT (REV. 4) PCS-012, CHANGE CONTROL PROCEDURE (REV. 3) SILO 3 PROJECT BASELINE
Engineering Design	RM-0034, STARTUP AND TURNOVER REQUIREMENTS MANUAL (REV. 1) ED-12-1003, ENGINEERING DESIGN GLOSSARY (REV. 2) ED-12-2005, ENGINEERING SUBCONTRACT SUPPORT MANAGEMENT (REV. 3) ED-12-2007, ALARA REVIEW (REV. 4) ED-12-3001, ENGINEERING DESIGN INITIATION (REV. 3) ED-12-3002, COLLECTION, VERIFICATION, AND USE OF ENGINEERING DATA (REV. 2)

FUNCTIONAL AREA	SILO 3 PROJECT FUNCTIONAL AREA DOCUMENTS
	<p>ED-12-4001, FUNCTIONAL REQUIREMENTS DOCUMENT (REV. 3)</p> <p>ED-12-4002, CONCEPTUAL DESIGN REPORT (REV. 2)</p> <p>ED-12-4003, DESIGN CRITERIA PACKAGE (REV. 3)</p> <p>ED-12-4004, DESIGN PACKAGE (REV. 5)</p> <p>ED-12-4005, CALCULATION PREPARATION AND REVIEW PROCESS (REV. 2)</p> <p>ED-12-4006, SPECIFICATION PREPARATION AND ISSUE (REV. 3)</p> <p>ED-12-4007, DRAWING PREPARATION AND ISSUE (REV. 4)</p> <p>ED-12-4009, PROCESS FLOW DIAGRAM PREPARATION AND ISSUE (REV. 3)</p> <p>ED-12-4010, DESIGN VERIFICATION (REV. 7)</p> <p>ED-12-4011, VENDOR SUBMITTALS (REV. 2, PCN 1)</p> <p>ED-12-4012, FACILITY ENGINEERING PROJECTS (REV. 3)</p> <p>ED-12-4015, PERFORMANCE GRADING (REV. 4)</p> <p>ED-12-4016, EQUIPMENT AND PIPING LABELING (REV. 4)</p> <p>ED-12-5001, PROJECT DOCUMENT CONTROL (ECDC) (REV. 4, UDC 1)</p> <p>ED-12-5002, ENGINEERING DESIGN CHANGE PROCESSES (REV. 6)</p> <p>ED-12-5005, FACILITY/LAND USE AUTHORITY (REV. 1)</p> <p>ED-12-6002, REDLINE/AS-BUILT DOCUMENT PROCESS (REV. 5)</p> <p>ED-12-6003, STARTUP/TURNOVER AND SYSTEM OPERABILITY TEST PROCEDURE (REV. 4)</p> <p>ED-12-7001, ENGINEERING INTERFACES DOCUMENT (REV. 2)</p> <p>ED-12-7002, REQUEST FOR ENGINEERING SERVICES (REV. 3)</p> <p>ED-12-8001, DESIGN ACTIVITY CLOSEOUT (REV. 2)</p> <p>ED-12-8002, PROPERTY TURNOVER (REV. 1)</p> <p>ED-12-9001, ENGINEERING QUALITY MANAGEMENT (REV. 3)</p> <p>ED-12-9002, ENGINEERING PRACTICES REVIEW PROCESS (REV. 3)</p> <p>ED-12-9004, PROJECT CLOSEOUT (REV. 5)</p>
Configuration Management	<p>PL-3035, CONFIGURATION MANAGEMENT (REV. 3)</p> <p>CM-0001, CONFIGURATION MANAGEMENT (REV. 6)</p>

FUNCTIONAL AREA	SILO 3 PROJECT FUNCTIONAL AREA DOCUMENTS
Acquisitions	AC-0001, REQUEST FOR PURCHASE (REV. 13) AC-0004, PROCESSING UNAUTHORIZED CONTRACTUAL COMMITMENTS (REV. 1) AC-0005, FLUOR DANIEL FERNALD FINANCIAL ACCOUNTABILITY PROGRAM (REV. 1) AC-0006, CREDIT CARD PURCHASES (REV. 3) AC-0007, FLUOR DANIEL FERNALD PERFORMANCE-BASED FEE DETERMINATION PLAN (REV. 0)
Property Management	RM-0033, GOVERNMENT PROPRTY MANAGEMENT REQUIREMENTS (REV. 3) PM-1000, TRACKING CONSTRUCTION WORK IN PROGRESS (CWIP) PERSONAL AND REAL PROPERTY ASSETS (REV. 2) PM-1001, MANAGING REAL PROPERTY (REV. 1) PM-1002, MANAGING GOVERNMENT-OWNED PERSONAL PROPERTY (REV. 3) PM-1003, LOANING GOVERNMENT PROPERTY (REV. 1) PM-1004, MANAGING HIGH RISK (HR) PROPERTY (REV. 2) PM-1006, CLASSIFYING PROPERTY AS HELD FOR FUTURE PROJECTS (REV. 2) PM-1007, MANAGING PRECIOUS METALS (REV. 1) PM-1008, CONTROLLING SUBCONTRACTOR-HELD GOVERNMENT PROPERTY (REV. 1) PM-1009, REPORTING LOST AND DAMAGED PROPERTY (REV. 3) PM-1010, PHYSICAL INVENTORIES OF GOVERNMENT PROPERTY (REV. 3) PM-1011, REQUESTING RELOCATION OF PROPERTY AND PERSONNEL (REV. 2) PM-2000, DISPOSING OF CLEAN SURPLUS SCRAP METAL THROUGH DEALERS/RECYCLERS (REV. 1) PM-2001, DISPOSITIONING SURPLUS GOVERNMENT PERSONAL PROPERTY THROUGH SALES (REV. 2) PM-2002, EXCESSING GOVERNMENT-OWNED PERSONAL PROPERTY (REV. 3) PM-2005, PREPARING MOTOR VEHICLES FOR DISPOSAL (REV. 1) PM-2006, CANNIBALIZING PROPERTY (REV. 1) PM-2007, FDF GIFT PROGRAM (REV. 1) PM-2008, ACQUIRING PROPERTY FROM OTHER DOE SITES (REV. 2) PM-4000, MISCELLANEOUS SHIPPING ORDER PREPARATION (REV. 5) PM-4001, MANAGING ITEMS IN THE STORES WAREHOUSES – NORTHSTAR AND SITE (REV. 2) PM-4003, INVENTORY CONTROL (STORES) OPERATION (REV. 2) PM-4004, PROCESSING MATERIALS THROUGH THE RECEIVING AND INCOMING MATERIALS INSPECTION AREA (REV. 5) PM-5000, MANAGING FLEET VEHICLES AND EQUIPMENT (REV. 2) PM-5003, CONTROL OF SITE COMMUNICATIONS EQUIPMENT (REV. 2)
Construction	ACR-002, CONTRACTOR SAFE WORK PLAN FORMAT REQUIREMENTS (REV. 4) CT-1.3.1, CONSTRUCTION FUNCTIONAL AREA ASSIGNED READING/TRAINING PROGRAM (REV. 4) CT-1.6.0, SITE WELDING MANAGEMENT PROGRAM (REV. 5) CT-1.6.1, WELDING PROCEDURE - ASME SECTION IX (REV. 5) CT-1.6.2, WELDING PROCEDURE - AWS CODE WELDING (REV. 4) CT-1.6.3, WELDING PROCEDURE - QUALIFICATION OF WELDERS AND WELDING OPERATORS (REV. 6)

FUNCTIONAL AREA	SILO 3 PROJECT FUNCTIONAL AREA DOCUMENTS
<b>Construction (Cont.)</b>	<p>CT-1.6.4, CONTROL OF WELDING CONSUMABLES (REV. 7)</p> <p>CT-2.1.1, CONSTRUCTION PROJECT PLANNING AND CONSTRUCTION INVITATION FOR BID/REQUEST FOR PROPOSAL (IFB/RFP) PREPARATION (REV. 11)</p> <p>CT-2.1.5, CONSTRUCTABILITY REVIEWS (REV. 5)</p> <p>CT-2.2.4, PRE-CONSTRUCTION KICK-OFF MEETINGS (REV. 6)</p> <p>CT-2.4.2, SUPPLIER DOCUMENTS (REV. 7)</p> <p>CT-3.1.1, CONTRACTOR SAFETY PROGRAM ADMINISTRATION (REV. 8)</p> <p>CT-3.1.4, CHANGE ORDERS (REV. 6)</p> <p>CT-3.1.6, CONTRACTOR BACKCHARGES (REV. 5)</p> <p>CT-3.1.7, CONTRACTOR PROGRESS PAYMENTS (REV. 4)</p> <p>CT-3.1.9, WARRANTY MANAGEMENT (REV. 4)</p> <p>CT-3.2.1, CONTRACTOR SCHEDULE STATUS (REV. 6)</p> <p>CT-3.3.1, DAILY ACTIVITY REPORTS AND FIELD LOGBOOKS (REV. 6)</p> <p>CT-3.3.4, PROGRESS PHOTOGRAPHS AND VIDEOS (REV. 6)</p> <p>CT-3.4.1, PERMIT REQUIREMENTS AND COORDINATION (REV. 9)</p> <p>CT-3.5.3, REQUEST FOR CLARIFICATION OF INFORMATION/DESIGN CHANGE NOTICE (RCI/DCN) (REV. 7)</p> <p>CT-3.6.1, CONSTRUCTION ACCEPTANCE/CONTRACTOR CLOSE-OUT (REV. 5)</p> <p>CT-3.7.1, CONSTRUCTION SUPPORT CONTRACT MANAGEMENT (REV. 5)</p> <p>CT-3.7.5, CONTROL AND VERIFICATION OF CONSTRUCTION SUPPORT CONTRACTOR WORK (REV. 7)</p> <p>CT-3.9.1, JURISDICTIONAL DISPUTES AND GRIEVANCES (REV. 4)</p> <p>CT-4.2.1, ASBESTOS ABATEMENT (REV. 5)</p> <p>SILOS PROJECT FACILITY / LAND USE ALLOCATION PROCEDURE</p>
<b>Human Resources and Industrial Relations</b>	<p>FERNALD ATOMIC TRADES AND LABOR COUNCIL CONTRACT AGREEMENT WITH FLOUR DANIEL FERNALD</p> <p>GREATER CINCINNATI BUILDING CONSTRUCTION TRADES COUNCIL CONTRACT AGREEMENT WITH FLOUR DANIEL FERNALD</p> <p>HR-0097, PROCESSING EMPLOYEE STATUS CHANGES (REV. 4)</p> <p>HR-0101, OPEN DOOR POLICY (REV. 2)</p> <p>HR-0102, TOTAL SALARIED WORKFORCE MANAGEMENT (REV. 5)</p> <p>HR-0103, EMPLOYING RELATIVES AND THOSE UNDER 18 (REV. 2)</p> <p>HR-0104, NEW ARRIVAL ORIENTATION PROGRAM (REV. 2)</p> <p>HR-0105, PROMOTION AND TRANSFER OF SALARIED EMPLOYEES (REV. 7)</p> <p>HR-0106, TERMINATION OF SALARIED EMPLOYEES (REV. 4)</p> <p>HR-0107, RELEASE OF EMPLOYEE INFORMATION (REV. 2)</p> <p>HR-0108, DEATH OF AN EMPLOYEE OR RETIREE (REV. 3)</p> <p>HR-0109, APPLYING FOR A POSITION CONTAINED IN THE JOB OPPORTUNITY LISTINGS (REV. 8)</p> <p>HR-0112, REQUESTING SUBCONTRACTOR LABOR-HOUR SERVICES (REV. 1)</p> <p>HR-0126, BUSINESS TRAVEL (REV. 8)</p> <p>HR-0127, PERMANENT RELOCATION (REV. 3)</p>

FUNCTIONAL AREA	SILO 3 PROJECT FUNCTIONAL AREA DOCUMENTS
Human Resources and Industrial Relations (Cont.)	<p>HR-0128, TEAMING PARTNER (TP) SUPPORT (REV. 6)</p> <p>HR-0134, PROJECT ASSIGNMENT (REV. 4)</p> <p>HR-0135, SALARIED EMPLOYEES' WORK HOUR GUIDELINES (REV. 6)</p> <p>HR-0140, NATURAL, CIVIL, OR OTHER EMERGENCIES (REV. 7)</p> <p>HR-0141, ABSENCE FROM WORK OR WORK STATION (REV. 2)</p> <p>HR-0143, SMOKING IN THE WORKPLACE (REV. 1)</p> <p>HR-0144, SUBSTANCE ABUSE PROGRAM (SAP) (REV. 5)</p> <p>HR-0145, EMPLOYEE DISCIPLINE (REV. 2)</p> <p>HR-0146, EQUAL EMPLOYMENT OPPORTUNITY/AFFIRMATIVE ACTION (REV. 1)</p> <p>HR-0147, HARASSMENT (REV. 4)</p> <p>HR-0148, BUSINESS ETHICS AND CONDUCT (REV. 4)</p> <p>HR-0150, SERVICE AWARDS AND SERVICE PINS (REV. 5)</p> <p>HR-0152, PROFESSIONAL MEMBERSHIPS AND REGISTRATIONS FOR SALARIED EMPLOYEES (REV. 3)</p> <p>HR-0155, THE FLUOR FOUNDATION MATCHING GIFT PROGRAM (REV. 2)</p> <p>HR-0162, SOLICITATION ON COMPANY PROPERTY (REV. 1)</p> <p>HR-0163, PROPER ATTIRE IN THE WORK PLACE (REV. 3)</p> <p>HR-0172, WORKPLACE VIOLENCE PREVENTION (REV. 2)</p> <p>HR-0173, USE OF COMPUTER RESOURCES (REV. 1)</p> <p>HR-0200, SALARY ADMINISTRATION (REV. 7)</p> <p>HR-0201, PERFORMANCE PLANNING AND ASSESSMENT (PAA) (REV. 6)</p> <p>HR-0202, EMPLOYEE CLASSIFICATIONS AND ELIGIBILITY FOR BENEFITS (REV. 5)</p> <p>HR-0203, OVERTIME FOR SALARIED EMPLOYEES (REV. 7)</p> <p>HR-0300, HOLIDAYS/FACILITY CLOSURE DAYS (REV. 6)</p> <p>HR-0301, VACATION FOR SALARIED EMPLOYEES (REV. 7)</p> <p>HR-0302, JURY OR WITNESS DUTY (REV. 3)</p> <p>HR-0303, MILITARY DUTY (REV. 4)</p> <p>HR-0304, MEDICAL LEAVE OF ABSENCE (MLOA) (REV. 6)</p> <p>HR-0305, TIME OFF TO VOTE (REV. 2)</p> <p>HR-0310, EMPLOYEE SERVICE DATES (REV. 5)</p> <p>HR-0311, LEAVE OF ABSENCE – UNPAID (REV. 5)</p> <p>HR-0312, SALARIED EMPLOYEE ABSENCE – PAID (REV. 8)</p> <p>HR-0313, FAMILY MEDICAL LEAVE OF ABSENCE (FMLA) – UNPAID (REV. 2)</p> <p>HR-0320, EMPLOYEE RETIREMENT (REV. 3)</p> <p>HR-0329, EMPLOYEE ASSISTANCE PROGRAM (REV. 4)</p> <p>HR-0335, FLUOR FOUNDATION SCHOLARSHIP PROGRAM (REV. 2)</p> <p>HR-0336, COST SAVINGS PROGRAM (REV. 0)</p> <p>HR-0400, WORKFORCE RESTRUCTURING TRANSITION(WRT) PROGRAM PART I – WORKFORCE PLANNING (REV. 0)</p> <p>HR-0401, WORKFORCE RESTRUCTURING TRANSITION(WRT) PROGRAM PART II - COMMUNICATING WRT</p>



FUNCTIONAL AREA	SILO 3 PROJECT FUNCTIONAL AREA DOCUMENTS
Human Resources and Industrial Relations (Cont.)	<p>INFORMATION TO FDF EMPLOYEES (REV. 0)</p> <p>HR-0402, WORKFORCE RESTRUCTURING TRANSITION(WRT) PROGRAM PART III – RETRAINING (REV. 0)</p> <p>HR-0403, WORKFORCE RESTRUCTURING TRANSITION(WRT) PROGRAM PART IV - VOLUNTARY SEPARATION (REV. 1)</p> <p>HR-0501, WORK SCOPE (WS) WORK PACKAGE (WP) REVIEW (REV. 1)</p> <p>HR-0620, TUITUIN AND PROFESSIONAL DEVELOPMENT ASSISTANCE (REV. 5)</p>
Operations & CONOPs	<p>RM-0025, PRE-OPERATIONAL ASSESSMENT (PA) PROGRAM (REV. 6)</p> <p>RM-0029, CONDUCT OF OPERATIONS PROGRAM MANUAL (REV. 3)</p> <p>RM-0034, START-UP AND TURNOVER REQUIREMENTS MANUAL (REV. 1)</p> <p>OP-0004, FLUOR DANIEL FERNALD LOCKOUT/TAGOUT (HAZARDOUS ENERGY AND MATERIAL CONTROL PROGRAM (REV. 7)</p> <p>OP-1001, OPERATIONS ORGANIZATION AND ADMINISTRATION (REV. 4)</p> <p>OP-1002, SHIFT ROUTINES AND OPERATING PRACTICES (REV. 1)</p> <p>OP-1003, CONTROL AREA ACTIVITIES (REV. 1)</p> <p>OP-1005, CONTROL OF ON-SHIFT TRAINING (REV. 1)</p> <p>OP-1006, EVENT INVESTIGATION AND REPORTING (REV. 5)</p> <p>OP-1008, CONTROL OF EQUIPMENT AND SYSTEM STATUS (REV. 1)</p> <p>OP-1010, INDEPENDENT VERIFICATION (REV. 1)</p> <p>OP-1011, LOGKEEPING (REV. 2)</p> <p>OP-1012, OPERATIONS TURNOVER (REV. 2)</p> <p>OP-1013, OPERATIONS ASPECTS OF FACILITY CHEMISTRY AND UNIQUE PROCESSES (REV. 1)</p> <p>OP-1014, FLUOR DANIEL FERNALD REQUIRED READING PROGRAM (REV. 5)</p> <p>OP-1015, TIMELY ORDERS TO OPERATORS (REV. 1)</p> <p>OP-1016, OPERATIONS PROCEDURES AVAILABILITY AND USE (REV. 1)</p> <p>OP-1017, OPERATOR AID POSTINGS (REV. 2)</p> <p>OP-1018, COMMUNICATIONS “FOR FACILITY OPERATIONS” (REV. 0)</p> <p>OP-1020, SITEWIDE LESSONS LEARNED (REV. 3)</p> <p>OP-1021, OPERATIONS DRILL PROGRAM (REV. 1)</p> <p>OP-1023, CONDUCT OF OPERATIONS (CONOPS) ASSESSMENTS (REV. 3)</p> <p>OP-1024, SITE FACILITIES MANAGEMENT (REV. 1)</p> <p>OP-1025, SEASONAL FACILITY PRESERVATION PROGRAM (REV. 1)</p> <p>OP-1027, EXECUTING MOVEMENT AND MONITORING EXCESS EQUIPMENT (PROPERTY), SCRAP, OR DEBRIS FROM THE FEMP SITE (REV. 0)</p> <p>OP-1028, AIR SYSTEMS INTERNATIONAL BREATHING AIR SYSTEM OPERATION (REV. 1, UDC 1)</p> <p>OP-1032, LAUNDRY DISTRIBUTION AND MANAGEMENT (REV. 1)</p> <p>OP-1033, STANDARD STARTUP REVIEWS (SSR) (REV. 1)</p> <p>OP-1034, OPERATIONAL READINESS REVIEW (ORR) (REV. 0)</p> <p>OP-1035, READINESS ASSESSMENT (RA) SYSTEM (REV. 0)</p> <p>OP-1036, QUALIFICATION/CERTIFICATION OF ASSESSMENT PERSONNEL OPERATIONS ASSURANCE (REV. 1)</p>

FUNCTIONAL AREA	SILO 3 PROJECT FUNCTIONAL AREA DOCUMENTS
Operations & CONOPs (Cont.)	<p>OP-1038, INSPECTION AND OPERATION OF THE NILFISK PORTABLE VACUUM (REV. 0)</p> <p>OP-1039, REPLACEMENT OF THE NILFISK PORTABLE VACUUM UNIT DUST BAGS (REV. 0)</p> <p>OP-1040, RADVAC 2000 WET VACUUM SYSTEM AND AIR-OPERATED VACUUM UNIT OPERATION (REV. 0)</p> <p>OP-1041, NORCLEAN PORTABLE VACUUM OPERATIONS (REV. 0)</p> <p>40000-D22-03-001, OU4 SILO DOME ACCESS PERMIT</p> <p>40000-D22-00-011, SILOS PROJECT MATERIAL LABORATORY WORK AUTHORIZATION PACKAGE PROCEDURE</p>
Maintenance	<p>RM-0051, CONTROL AND CALIBRATION OF MEASURING AND TEST EQUIPMENT (M&amp;TE) (REV. 1)</p> <p>PL-3080, MAINTENANCE IMPLEMENTATION PLAN (REFERENCES) (REV. 2)</p> <p>PL-3049, IMPLEMENTATION PLAN FOR SAFETY ANALYSIS REPORTS &amp; TECHNICAL SAFETY REQUIREMENTS AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT, SAFETY PROGRAM SUMMARY DESCRIPTION NO.9, PRE-OPERATIONAL ASSESSMENT, TESTING, SURVEILLANCE, INSPECTION, AND MAINTENANCE PROGRAM. (REV. 4, UDC 1)</p> <p>MT-0003, FEMP WORK REQUEST/ORDER PROCEDURE (REV. 12, UDC 1)</p> <p>MT-0005, SITE RIGGING LOFT PROGRAM (REV. 5)</p> <p>MT-0008, SITE TOOL CRIB PROGRAM (REV. 2)</p> <p>MT-0016, ASSEMBLY/DISASSEMBLY OF SCAFFOLDING (REV. 1)</p> <p>MT-0017, CONTROLLING PORTABLE HEPA FILTRATION DEVICES (HFDS) (REV. 2)</p> <p>MT-0018, QUALIFICATION OF HEPA FILTRATION SYSTEM TEST PERSONNEL (REV. 1)</p>
Research and Development	<p>This functional area is not applicable to the Silo 3 Project, since all technologies, equipment, and materials are required to be industry standard per the Silo 3 contract 99W0000445.</p>
Occupational Safety and Health	<p>RM-0007, FEMP RESPIRATORY PROTECTION REQUIREMENTS MANUAL (REV. 4)</p> <p>RM-0011, CONTROL OF OCCUPATIONAL EXPOSURE TO BLOODBORNE PATHOGENS (REV. 5)</p> <p>RM-0016, MANAGEMENT PLAN (REV. 42)</p> <p>RM-0021, SAFETY PERFORMANCE REQUIREMENTS MANUAL (REV. 28)</p> <p>RM-0045, HOISTING &amp; RIGGING MANUAL (REV. 5)</p> <p>RM-0047, FUGITIVE DUST CONTROL REQUIREMENTS (REV. 1 UDC 1)</p> <p>RM-3001, LABORATORY CHEMICAL HYGEINE MANUAL (REV. 3)</p> <p>PL-3049, IMPLEMENTATION PLAN FOR SAFETY ANALYSIS REPORTS &amp; TECHNICAL SAFETY REQUIREMENTS AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT, SAFETY PROGRAM SUMMARY DESCRIPTIONS NO.4, OCCUPATIONAL SAFETY &amp; HEALTH PROGRAM; NO. 8, INSTITUTIONAL SAFETY &amp; MANAGEMENT PROGRAM; AND NO. 11, ASBESTOS CONTROL PROGRAM (REV. 4, UDC 1)</p> <p>PL-3079, FLUOR DANIEL FERNALD MEDICAL QUALITY MANAGEMENT PLAN (REV. 1)</p> <p>PL-3081, SAFETY MANAGEMENT SYSTEM DESCRIPTION (SMSD) (REV. 2)</p> <p>ACR-0004, CONTRACTOR LADDER INSPECTION REQUIREMENTS (REV. 2)</p> <p>OP-0004, FLOUR DANIEL FERNALD LOCKOUT/TAGOUT (HAZARDOUS ENERGY AND MATERIAL CONTROL) PROCEDURE (REV. 7)</p> <p>OP-1006, EVENT INVESTIGATION AND REPORTING (REV. 5)</p> <p>SH-0001, DEVELOPMENT AND ISSUE OF PROJECT SPECIFIC HEALTH AND SAFETY REQUIREMENTS (REV. 2)</p> <p>SH-0012, DOE WORKPLACE SUBSTANCE ABUSE PROGRAM (SAP) (REV. 1)</p> <p>SH-0013, ESTABLISHING AND CONTROLLING BREAKROOMS AND WATER STATIONS IN THE CONTROLLED AREA (REV. 5)</p>

FUNCTIONAL AREA	SILO 3 PROJECT FUNCTIONAL AREA DOCUMENTS
Occupational Safety and Health (Cont.)	<p>SH-0014, OFFSITE FIRST RESPONDER PROCEDURE (REV. 1)</p> <p>SH-0015, RESPIRATORY INVENTORY CONTROL (REV. 1)</p> <p>SH-0016, CHEMICAL HAZARD COMMUNICATION AND CARCINOGEN CONTROL (REV. 2)</p> <p>SH-0017, RESPIRATOR ISSUANCE (REV. 4)</p> <p>SH-0018, PENETRATION PERMITTING PROGRAM (REV. 4)</p> <p>SH-0020, SERVICES INTERRUPTION PERMITTING PROGRAM (REV. 1)</p> <p>SH-0021, FEMP WORK PERMIT PROCEDURE (REV. 2)</p> <p>SH-0022, USE OF RESPIRATORY PROTECTION DEVICES (REV. 0)</p> <p>SH-0023, HOISTING AND RIGGING SERVICES (REV. 2)</p> <p>602-5001 OPERATION OF THE CGM 929 GAS DETECTION INSTRUMENT (REV. 0)</p> <p>602-5002 CONFINED SPACE EVALUATION AND ISSUING CONFINED SPACE ENTRY PERMITS (REV. 1)</p> <p>602-5003 MICRO TIP PHOTOIONIZATION AIR ANALYZERS (REV. 0)</p> <p>602-5004 INDUSTRIAL HYGIENE INSTRUMENT REPAIR, CALIBRATION, AND TRACKING SYSTEM (REV. 1)</p> <p>602-5005 RESPIRATOR FIT TESTING (REV. 2)</p> <p>602-5006 ISSUING PERMITS FOR ASBESTOS WORK (REV. 0)</p> <p>602-5007 ISSUING CHEMICAL HAZARDOUS MATERIAL WORK PERMITS (REV. 0)</p> <p>602-5008 COLLECTING BULK SAMPLES OF SUSPECT ASBESTOS-CONTAINING MATERIALS (REV. 1)</p> <p>602-5009 CONDUCTING ILLUMINATION SURVEY WITH LUX LIGHT METER (REV. 0)</p> <p>602-5010 STANDARD PITOT TUBE METHOD FOR MEASURING STATIC PRESSURE IN DUCTS (REV. 0)</p> <p>602-5011 CALIBRATING INDUSTRIAL HYGIENE AIR SAMPLING PUMPS WITH THE GILBRATOR AIRFLOW CALIBRATOR (REV. 0)</p> <p>602-5012 MEASURING AIR VELOCITY IN EXHAUST VENTILATION DUCTS AND CALCULATING STACK LOSS CONVERSION FACTORS (REV. 0)</p> <p>602-5013 AIR MONITORING WITH THE DRAAGER MULTI-GAS DETECTOR (REV. 1)</p> <p>602-5014 PERFORMING LABORATORY FUME HOOD SURVEYS (REV. 1)</p> <p>602-5015 MAINTENANCE AND USE OF THE RAM-1 REAL-TIME AEROSOL MONITOR (REV. 0)</p> <p>602-5016 OPERATIONS OF MDA SPM SINGLE POINT MONITOR (REV. 1)</p> <p>602-5017 EVALUATION OF LOCAL EXHAUST VENTILATION SYSTEMS (REV. 1)</p> <p>602-5018 NOISE LEVEL EXPOSURE EVALUATIONS (REV. 1)</p> <p>602-5019 RESPIRATOR SELECTION FOR CHEMICAL AIR CONTAMINANTS (REV. 0)</p> <p>602-5020 PAPR MAINTENANCE AND USE (REV. 1)</p> <p>602-5021 MICROWAVE OVEN SURVEY PROCEDURE (REV. 0)</p> <p>602-5022 CHECKING RECONDITIONS RESPIRATORS (REV. 1)</p> <p>602-5023 BREATHING AIR QUALITY CHECKS (REV. 0)</p> <p>602-5024 INDUSTRIAL HYGIENE AIR SAMPLING PROGRAM (REV. 0)</p>

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Radiological Protection	<p>RM-0015, FEMP ALARA REQUIREMENTS MANUAL (REV. 4)</p> <p>RM-0020, RADIOLOGICAL CONTROL REQUIREMENTS MANUAL (REV. 12)</p> <p>PL-3049, IMPLEMENTATION PLAN FOR SAFETY ANALYSIS REPORTS &amp; TECHNICAL SAFETY REQUIREMENTS AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT, SAFETY PROGRAM SUMMARY DESCRIPTION NO.6, RADIOLOGICAL CONTROL PROGRAM (REV. 4, UDC 1)</p> <p>PL-3062, IMPLEMENTATION PLAN AND RADIOLOGICAL PROTECTION PROGRAM FOR 10CFR PART 835 (REV. 1)</p> <p>ACR-005 CONTRACTOR DISPOSABLE ANTI-CONTAMINATION CLOTHING REQUIREMENTS (REV. 1)</p> <p>RP-0019, OCCUPATIONAL ALARA PLANNING AND REVIEW (REV. 1)</p> <p>RP-0020 RADIOLOGICAL WORK PERMITTING AND AUTHORIZATION (REV. 1)</p> <p>RP-0021, RADIOLOGICAL CONTROL ADMINISTRATIVE REQUIREMENTS (REV. 0, UDC 1)</p> <p>RP-0022, POSTING AND ACCESS TO RADIOLOGICAL AREAS (REV. 0, UDC 1)</p> <p>RP-0023, EXPOSURE CONTROL AND MONITORING (REV. 0)</p> <p>RP-0024, CONTAMINATION CONTROL AND MONITORING (REV. 0)</p> <p>RP-0025, RADIOLOGICAL RELEASE OF ITEMS AND MATERIALS (REV. 0)</p> <p>RP-0026, CONTROL AND LABELING OF RADIOACTIVE MATERIAL (REV. 0)</p>
Nuclear and System Safety	<p>RM-0027, NUCLEAR CRITICALITY SAFETY REQUIREMENTS (REV. 7)</p> <p>RM-2116, SYSTEM SAFETY REQUIREMENTS (REV. 6)</p> <p>PL-2352, FEMP HAZARD SURVEY AND HAZARD ASSESSMENT (REV. 0)</p> <p>PL-3049, IMPLEMENTATION PLAN FOR SAFETY ANALYSIS REPORTS &amp; TECHNICAL SAFETY REQUIREMENTS AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT; APPENDIX K, SILOS 1 AND 2 BASIS FOR INTERIM OPERATIONS; APPENDIX M, SAFETY DOCUMENTATION FOR SAFE SHUTDOWN OPERATIONS; APPENDIX N, SAFETY DOCUMENTATION FOR MATERIAL STORAGE, HANDLING, AND RELATED ACTIVITIES; AND APPENDIX O, SAFETY DOCUMENTATION FOR NUCLEAR CRITICALITY SAFETY (REV. 4, UDC 1)</p> <p>NS-0001, NUCLEAR CRITICALITY SAFETY ANALYSIS AND APPROVAL PROCESS (REV. 7)</p> <p>NS-0002, UNREVIEWED SAFETY QUESTION (USQ) DETERMINATION AND SAFETY EVALUATION SYSTEM (REV. 6)</p> <p>NS-0003, OBTAINING SAFETY ANALYSIS SUPPORT (REV. 5)</p> <p>NS-0005, INITIATING, REVIEWING, AND APPROVING DOE-APPROVED SBDS (REV. 3)</p> <p>NS-0006, NUCLEAR CRITICALITY SAFETY POSTING (REV. 4)</p> <p>NS-0007, PROCEDURE CATEGORIZATION PROCESS (REV. 1)</p> <p>NS-0008, SAFETY BASIS DOCUMENT REVIEW (SBD R) PROCESS (REV. 3)</p> <p>SA-DPT-004, HUMAN FACTORS EVALUATION (HFE) METHODOLOGY (REV. 3)</p> <p>SA-DPT-005, SAFETY ANALYSIS DOCUMENT CONTROL AND RECORDS MANAGEMENT (REV. 1)</p> <p>SA-DPT-007, SAFETY ASSESSMENT METHODOLOGY (REV. 2)</p> <p>SA-DPT-008, CONDUCT AND DOCUMENT USQD SAFETY EVALUATIONS (REV. 3)</p> <p>SA-DPT-009, SA TEAM INTERFACE WITH THE AWP (REV. 2)</p> <p>SA-DPT-010, CONDUCT &amp; DOCUMENT SBDRS (REV. 1)</p>
Emergency Preparedness and Management	<p>ERPG, EMERGENCY RESPONSE PLANNING GUIDELINES (ERPGS), AMERICAN INDUSTRIAL HYGIENE ASSOCIATION</p> <p>PL-3020, FEMP EMERGENCY PLAN (REV. 5)</p> <p>PL-3043, TRANSPORTATION EMERGENCY PLAN (REV. 3)</p>

FUNCTIONAL AREA	SILO 3 PROJECT FUNCTIONAL AREA DOCUMENTS
Emergency Preparedness and Management (Cont.)	<p>PL-3049, IMPLEMENTATION PLAN FOR SAFETY ANALYSIS REPORTS &amp; TECHNICAL SAFETY REQUIREMENTS AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT SAFETY PROGRAM SUMMARY DESCRIPTION NO. 1, EMERGENCY PREPAREDNESS AND OCCURRENCE REPORTING PROGRAMS (REV. 4, UDC 1)</p> <p>EM-0001, EQUIPMENT INVENTORY FOR EMERGENCY PREPAREDNESS (REV. 2)</p> <p>EM-0002, DRILLS AND EXERCISES (REV. 3)</p> <p>EM-0005, EMERGENCY MONITORING TEAM PROCEDURE (REV. 2)</p> <p>EM-0006, EMERGENCY PREPAREDNESS TRAINING FOR EMERGENCY OPERATION CENTER STAFF (REV. 2)</p> <p>EM-0008, NOTIFICATION OF NEXT OF KIN (REV. 3)</p> <p>EM-0009, FLOW OF INFORMATION (REV. 2)</p> <p>EM-0012, CONDUCTING EVENT DEBRIEFINGS AND CRITIQUES (REV. 5)</p> <p>EM-0014, NUCLEAR CRITICALITY ACCIDENT RESPONSE (REV. 3)</p> <p>EM-0017, SUPPORT OF ACCIDENT INVESTIGATIONS (REV. 4)</p> <p>EM-0020, BUILDING EMERGENCY PROCEDURE (REV. 7)</p> <p>EM-0021, FERNALD ENVIRONMENTAL MANAGEMENT PROJECT (FEMP) OFFSITE EMERGENCY WARNING SYSTEM (REV. 7)</p> <p>EM-0023, BOMB THREAT PROCEDURE (REV. 3)</p> <p>EM-0024, OFFSITE EMERGENCY PROCEDURE (REV. 2)</p> <p>EM-0026, CURTAILING OPERATIONS AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT (FEMP) DUE TO ABNORMAL CONDITIONS (REV. 3)</p> <p>EM-0027, ROOT CAUSE ANALYSIS USING SYSTEMS IMPROVEMENTS' ROOT CAUSE TREE (REV. 3)</p> <p>EM-0028, AUDIBLE COMMUNICATIONS (REV. 2)</p> <p>EM-0030, SILO AREA EMERGENCY PROCEDURE (REV. 4)</p> <p>EM-0031, SARA 311/312 REPORTING (REV. 2)</p> <p>EM-0033, OCCURRENCE REPORTING (REV. 1)</p> <p>EM-0034, TRANSPORTATION EMERGENCY RECOVERY TEAM (REV. 1)</p> <p>EM-0035, WASTE PIT REMEDIAL ACTION PROJECT (WPRAP) AREA EMERGENCY RESPONSE PROCEDURE (REV. 1)</p> <p>OP-1006, EVENT INVESTIGATION AND REPORTING (REV. 5)</p> <p>PL-2352, FEMP HAZARD SURVEY AND HAZARD ASSESSMENT (REV. 0)</p>
Fire Protection	<p>RM-0021, SAFETY PERFORMANCE REQUIREMENTS MANUAL (REV. 28)</p> <p>RM-0024, FIRE PROTECTION REQUIREMENTS MANUAL (REV. 7)</p> <p>EMERGENCY RESPONSE TEAM (ERT) MANUAL</p> <p>PL-3049, IMPLEMENTATION PLAN FOR SAFETY ANALYSIS REPORTS &amp; TECHNICAL SAFETY REQUIREMENTS AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT. SAFETY PROGRAM SUMMARY DESCRIPTION NO. 3, FIRE PROTECTION (REV. 4, UDC 1)</p> <p>ACR-003, FIRE EXTINGUISHER INSPECTION REQUIREMENTS (REV. 3)</p> <p>ACR-006, PORTBALE STRUCTURES (REV. 1)</p> <p>FP-0001, OPEN FLAME AND WELDING PERMIT (REV. 2)</p> <p>FP-0002, INSPECTION, MAINTENANCE, AND TESTING OF FIRE PUMPS (REV. 4)</p> <p>FP-0003, FIRE PROTECTION SYSTEM OPERABILITY PROCEDURE (REV. 3)</p>

FUNCTIONAL AREA	SILO 3 PROJECT FUNCTIONAL AREA DOCUMENTS
Safeguards and Security	<p>THE SECURITY MEASURES IMPLEMENTED FOR THE SILO 3 PROJECT ARE SIMILAR TO THOSE IMPLEMENTED FOR THE REST OF THE SITE AND ARE STANDARD FEMP SECURITY PRACTICES.</p> <p>RM-0055, ACCESS TO FERNALD (REV. 3)</p> <p>PL-3006, MATERIAL CONTROL AND ACCOUNTABILITY (MC&amp;A) PLAN (REV. 3)</p> <p>PL-3055, FERNALD PHYSICAL PROTECTION SECURITY PLAN (REV. 5)</p> <p>SE-0002, FOREIGN TRAVEL (REV. 4)</p> <p>SE-0003, LOCK AND KEY PROCEDURE (REV. 2)</p> <p>SE-0004, IDENTIFYING, PROTECTING, AND HANDLING UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION (UNCI) (REV. 2)</p> <p>SE-0005, FOREIGN NATIONALS (REV. 2)</p> <p>SE-0006, COMPLETING THE ITEM PRODUCT /CERTIFICATION/IDENTIFICATION FORM, 65 CARD (REV. 6)</p> <p>SE-0007, COMPLETING THE MATERIAL MOVEMENT RECORD FORM (REV. 5)</p> <p>SE-0008, DOCUMENT IDENTIFICATION MARKING CHANGES OF NUCLEAR MATERIALS AND WASTE MANAGEMENT (REV. 1)</p> <p>SE-0010, REPORTING INCIDENTS OF SECURITY CONCERN (REV. 1)</p> <p>SE-0011, MONITORING COMPUTER USE (REV. 1)</p> <p>SE-0012, PRE-EMPLOYMENT BACKGROUND INVESTIGATION (REV. 1)</p>
Environmental Protection	<p>STIPULATED AMENDMENT TO CONSENT DECREE, JANUARY 1993</p> <p>RM-0047, FUGITIVE DUST CONTROL REQUIREMENTS (REV. 1, UDC 1)</p> <p>RM-0050, ASBESTOS CONTROL PROGRAM (REV. 1, UDC 1)</p> <p>PL-2194, SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN (REV. 4)</p> <p>PL-3008, NESHAP SUBPART H PROGRAM PLAN (NSPP) FOR NON-AMBIENT AIR MONITORS (REV. 5)</p> <p>PL-3049, IMPLEMENTATION PLAN FOR SAFETY ANALYSIS REPORTS &amp; TECHNICAL SAFETY REQUIREMENTS AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT, SAFETY PROGRAM SUMMARY DESCRIPTION NO.2, ENVIRONMENTAL MONITORING AND SURVEILLANCE PROGRAM (REV. 4, UDC 1)</p> <p>PL-3083, STORMWATER POLLUTION PREVENTION PLAN (REV. 0)</p> <p>EP-0001, NATIONAL ENVIRONMENTAL POLICY ACT (REV. 4)</p> <p>EP-0003, UNEXPECTED DISCOVERY OF CULTURAL RESOURCES (REV. 3)</p> <p>EP-0004, SPILL INCIDENT REPORTING AND CLEANUP (REV. 4)</p> <p>EP-0005, CONTROLLING AQUEOUS WASTEWATER DISCHARGES INTO THE WASTEWATER TREATMENT SYSTEM (REV. 4)</p> <p>EP-0006, FREON MANAGEMENT (REV. 2)</p> <p>EP-0007, ENVIRONMENTAL ALARA (REV. 1)</p> <p>EP-0008, ACCESS TO A CERTIFIED AREA (CA) (REV. 3, UDC 1)</p> <p>EP-0011, SPILL INCIDENT REPORTING (REV. 0)</p>
Quality Assurance	<p>RM-0012, QUALITY ASSURANCE PROGRAM (REV. 5)</p> <p>PL-3029, QA RULE IMPLEMENTATION (REV. 2)</p> <p>PL-3049, IMPLEMENTATION PLAN FOR SAFETY ANALYSIS REPORTS &amp; TECHNICAL SAFETY REQUIREMENTS AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT, SAFETY PROGRAM SUMMARY DESCRIPTION NO.5, QUALITY ASSURANCE PROGRAM (REV. 4, UDC 1)</p>

FUNCTIONAL AREA	SILO 3 PROJECT FUNCTIONAL AREA DOCUMENTS
Quality Assurance (Cont.)	<p>FD-1000, SITEWIDE CERCLA QUALITY (SCQ) ASSURANCE PROJECT PLAN (REV. 1)</p> <p>QA-0001, FLUOR FERNALD NONCONFORMANCE IDENTIFICATION AND TRACKING SYSTEM (REV. 11)</p> <p>QA-0003, IDENTIFYING QUALITY ASSURANCE PROGRAM REQUIREMENTS FOR QUALITY LEVELS (REV. 4)</p> <p>QA-0004, ADMINISTRATION AND CONDUCT OF AUDIT ACTIVITIES (REV. 6)</p> <p>QA-0007, ADMINISTRATION AND CONDUCT OF SURVEILLANCE ACTIVITIES (REV. 5)</p> <p>QA-0008, QUALITY ASSURANCE STOP WORK REQUEST/ORDER AUTHORITY (REV. 2)</p> <p>QA-0009, QUALITY ASSURANCE JOB SPECIFIC PLANNING (REV. 3)</p> <p>QA-0017, ADMINISTRATION AND CONDUCT OF SELF-ASSESSMENT ACTIVITIES (REV. 2)</p> <p>QA-0018, FLUOR FERNALD ASSESSMENTS PROGRAM (REV. 2)</p> <p>QA-0019, CORRECTIVE ACTION PLANS (REV. 1)</p>
Training and Qualification	<p>RM-0002, TRAINING REQUIREMENTS PROGRAM MANUAL (REV. 4)</p> <p>RM-0012, QUALITY ASSURANCE PROGRAM (REV. 5)</p> <p>RM-0020, RADIOLOGICAL CONTROL REQUIREMENTS MANUAL (REV. 12)</p> <p>RM-0021, SAFETY PERFORMANCE REQUIREMENTS (REV. 28)</p> <p>RM-0029, FLUOR DANIEL FERNALD CONDUCT OF OPERATIONS (CONOPS) PROGRAM (REV. 3)</p> <p>RM-0043, TRAINING IMPLEMENTATION MATRIX (REV. 3)</p> <p>RM-0055, ACCESS TO FERNALD REQUIREMENTS MANUAL (REV. 3)</p> <p>PL-3049, IMPLEMENTATION PLAN FOR SAFETY ANALYSIS REPORTS &amp; TECHNICAL SAFETY REQUIREMENTS AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT, SAFETY PROGRAM SUMMARY DESCRIPTION NO.7, TRAINING PROGRAM (REV. 4, UDC 1)</p> <p>PL-3080, MAINTENANCE IMPLEMENTATION PLAN (REFERENCES) (REV. 2)</p> <p>PL-3081, SAFETY MANAGEMENT SYSTEM DESCRIPTION (REV. 2)</p> <p>CT-1.3.1, CONSTRUCTION FUNCTIONAL AREA ASSIGNED READING/TRAINING PROGRAM (REV. 4)</p> <p>OP-1014, FLUOR DANIEL FERNALD REQUIRED READING PROGRAM (REV. 5)</p> <p>OP-1020, SITEWIDE LESSONS LEARNED (REV. 3)</p> <p>TR-0002, TRAINING ANALYSIS AND PROGRAM DESIGN (REV. 5)</p> <p>TR-0004, FERNALD SITEWIDE TRAINING PROCEDURE (REV. 5)</p> <p>TR-0007, EVALUATION OF TRAINING (REV. 3, UDC 1)</p> <p>TR-0008, TRAINING MATERIALS DEVELOPMENT AND APPROVAL (REV. 4)</p> <p>TR-0013, IMPLEMENTATION, QUALIFICATION AND CERTIFICATION (REV. 2)</p>
Environmental Restoration and Waste Management	<p>RM-0041, RADIOLOGICAL CHARACTERIZATION PROGRAM MANUAL (REV. 1, UDC 1)</p> <p>RM-0053, WASTE CHARACTERIZATION INFORMATION MANUAL (REV. 0, UDC 2)</p> <p>RM-0057, CONTAINER MARKING AND LABELING REQUIREMENTS (REV. 1)</p> <p>FD-1000, SITEWIDE CERCLA QUALITY (SCQ) ASSURANCE PROJECT PLAN (REV. 1)</p> <p>PL-3009, WASTE MINIMIZATION AND POLLUTION PREVENTION AWARENESS PLAN (REV. 1)</p> <p>PL-3048, PROTOTYPE SAMPLING AND ANALYSIS PLAN FOR WASTE AT THE FEMP (REV. 2)</p> <p>PL-3078, FEMP WASTE CHARACTERIZATION PROGRAM PLAN (REV. 3)</p>



FUNCTIONAL AREA	SILO 3 PROJECT FUNCTIONAL AREA DOCUMENTS
<b>Environmental Restoration and Waste Management (Cont.)</b>	<p>20100-PL-0014, WASTE ACCEPTANCE CRITERIA ATTAINMENT PLAN FOR THE ON-SITE DISPOSAL FACILITY (REV. 0)</p> <p>EW-0001, MEF CHARACTERIZATION PROCESS PROCEDURE (REV. 9)</p> <p>EW-0002, CHAIN OF CUSTODY/REQUEST FOR ANALYSIS RECORD FOR SAMPLE CONTROL (REV. 1)</p> <p>EW-0004, HAZARDOUS WASTE SATELLITE ACCUMULATION AREAS (REV. 8)</p> <p>EW-0005, HANDLING CONTAINERS OF UNIDENTIFIED MATERIAL (REV. 2)</p> <p>EW-0006, MANAGEMENT OF ABOVE-GRADE DEBRIS (REV. 7, UDC 2)</p> <p>EW-0007, CONTACT WITH REGULATORY AGENCIES (REV. 5)</p> <p>EW-0008, MAINTENANCE OF THE ADMINISTRATIVE RECORD FILES (REV. 2)</p> <p>EW-0010, FEMP DATA VALIDATION PROCEDURE (REV. 3)</p> <p>EW-0014, MANAGING PCBs AND PCB ITEMS (REV. 5)</p> <p>EW-0015, FEMP RCRA OPERATING RECORD (REV. 3)</p> <p>EW-0025, ESTABLISHMENT AND MAINTENANCE OF THE POST RECORD OF DECISION FILES (REV. 2)</p> <p>EW-1015, INSPECTION OF HAZARDOUS WASTE MANAGEMENT UNITS (HWMUS) AND RCRA AREAS (REV. 4)</p> <p>EW-1016, WASTE MANAGEMENT TASK ORDER PLANNING PROCESS (REV. 9)</p> <p>EW-1020, SCHEDULING SAMPLES USING THE FACTS SAMPLE SCHEDULER (REV. 2)</p> <p>EW-1021, PREPARATION OF THE PROJECT WASTE IDENTIFICATION AND DISPOSITION (PWID) REPORT (REV. 2)</p> <p>EW-1022, ON-SITE TRACKING AND MANIFESTING OF BULK EXCAVATED MATERIAL (REV. 3)</p> <p>EW-1023, MANAGEMENT OF STOCK PILES (REV. 2)</p> <p>EW-1024, MANAGEMENT OF MATERIAL REQUIRING CONTAINERIZATION DURING SOIL EXCAVATIONS (REV. 2)</p> <p>EW-1025, COLLECTION AND DISPOSAL OF CONTROLLED AREA NON-CONTAMINATED TRASH (REV. 2)</p> <p>EW-1026, NEVADA TEST SITE WASTE PROFILE PREPARATION (REV. 1)</p> <p>EW-1028, TRANSFER OF WASTE INVENTORY IDENTIFIED FOR DISPOSITION TO WASTE MANAGEMENT PROJECTS DIVISION (REV. 0)</p>
<b>Packaging and Transportation</b>	<p>PL-3044, FEMP SHIPPING SERVICES PLAN (REV. 3)</p> <p>PL-3067, FLUOR FERNALD WASTE CERTIFICATION PROGRAM PLAN (REV. 5, UDC 1)</p> <p>PT-0003, CONTROL AND ISSUANCE OF EMPTY CONTAINERS AT THE FEMP (REV. 5)</p> <p>PT-0005, PACKAGING LOW-LEVEL RADIOACTIVE WASTE (LLRW) IN DRUMS (REV. 6)</p> <p>PT-0006, PACKAGING LOW LEVEL RADIOACTIVE WASTE (LLRW) IN ISO CONTAINERS (REV. 8, UDC 1)</p> <p>PT-0007, PACKAGING LOW-LEVEL RADIOACTIVE WASTE (LLRW) IN METAL BOXES (REV. 7)</p> <p>PT-0009, COLLECTION OF CONTAMINATED TRASH FOR DISPOSITION (REV. 7)</p> <p>PT-0011, EVALUATING LOW-LEVEL RADIOACTIVE WASTE (LLRW) STREAMS FOR SHIPMENT TO THE NEVADA TEST SITE (NTS) (REV. 5)</p> <p>PT-0013, CONTACT WITH THE NEVADA TEST SITE (REV. 3)</p> <p>PT-0014, FEMP APPROVED PACKAGING AND SHIPPING CONTAINERS (REV. 2)</p> <p>PT-0017, SHIPMENT OF HAZARDOUS CYLINDERS (REV. 2)</p> <p>PT-0018, PREPARATION OF DOCUMENTATION FOR OFF-SITE SHIPMENT OF HAZARDOUS MATERIAL (REV. 4)</p> <p>PT-0019, PACKAGING RCRA EXEMPTED (RECYCLABLE) WASTE FOR ACCEPTANCE AT THE CLEAN SIDE STORAGE LOCKER (REV. 0)</p>



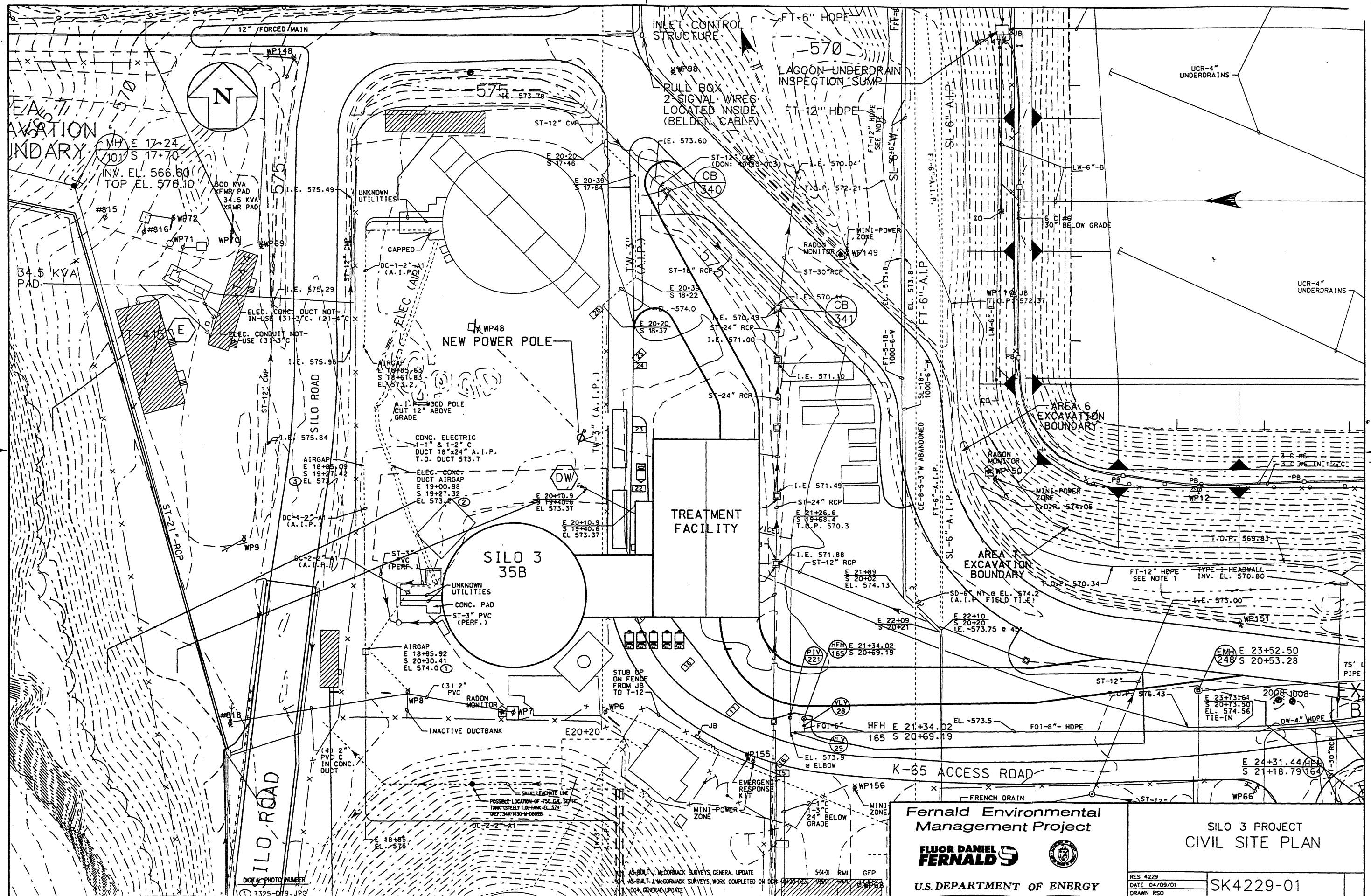
FUNCTIONAL AREA	SILO 3 PROJECT FUNCTIONAL AREA DOCUMENTS
Packaging and Transportation (Cont.)	PT-0021, CARRIER VEHICLE WEIGHING (REV. 1, UDC 1) PT-0022, SPENT LEAD ACID BATTERY MANAGEMENT (REV. 0) PT-0023, UNPACKING CONTAINERS (REV. 1)
Decommissioning	RM-0021, SAFETY PERFORMANCE REQUIREMENTS MANUAL (REV. 28) ACR-001, CONTRACT SUBMITTAL REQUIREMENTS (REV. 10) ACR-007, WASTE MATERIAL HANDLING CRITERIA FOR CONSTRUCTION PROJECTS (PART 7, SECTION 2.0) (REV. 2) OP-0004, FDF LOCKOUT / TAGOUT PROCEDURE (REV. 7) ED-12-8002, PROPERTY TURNOVER (REV. 1)
Project Closeout	ED-12-9004, PROJECT CLOSEOUT (REV. 5)

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## **APPENDIX D – SKETCHES AND DRAWINGS**







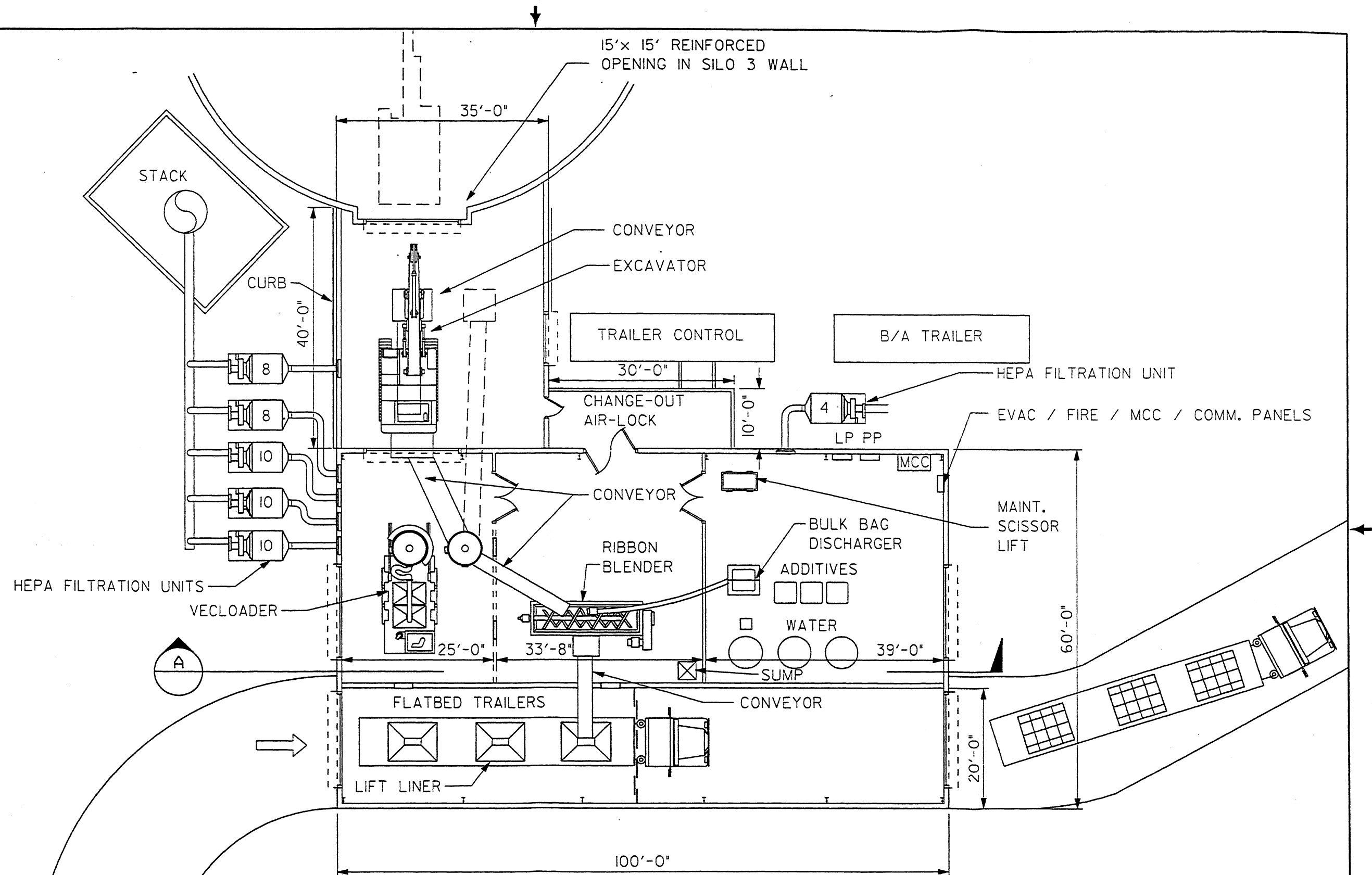
Fernald Environmental Management Project

**FLUOR DANIEL FERNALD**

U.S. DEPARTMENT OF ENERGY

SILO 3 PROJECT CIVIL SITE PLAN

RES 4229	SK4229-01
DATE 04/09/01	
DRAWN RSD	



PLAN  
NTS (1)

Fernald Environmental  
Management Project

FLUOR DANIEL  
**FERNALD**

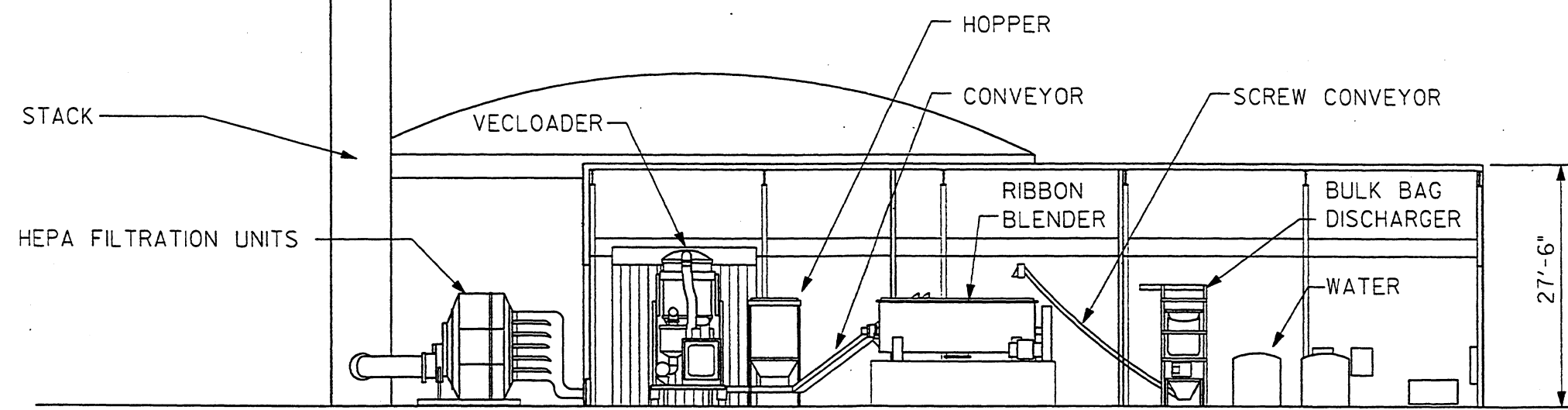
U.S. DEPARTMENT OF ENERGY

SILLO 3 PROJECT  
FLOOR & EQUIPMENT PLAN

RES 4229  
DATE 04/05/01  
DRAWN RSO

SK-4229-02

FILE NAME: RES4229/SILO3PRO.DGN



SECTION A  
NTS

Fernald Environmental  
Management Project



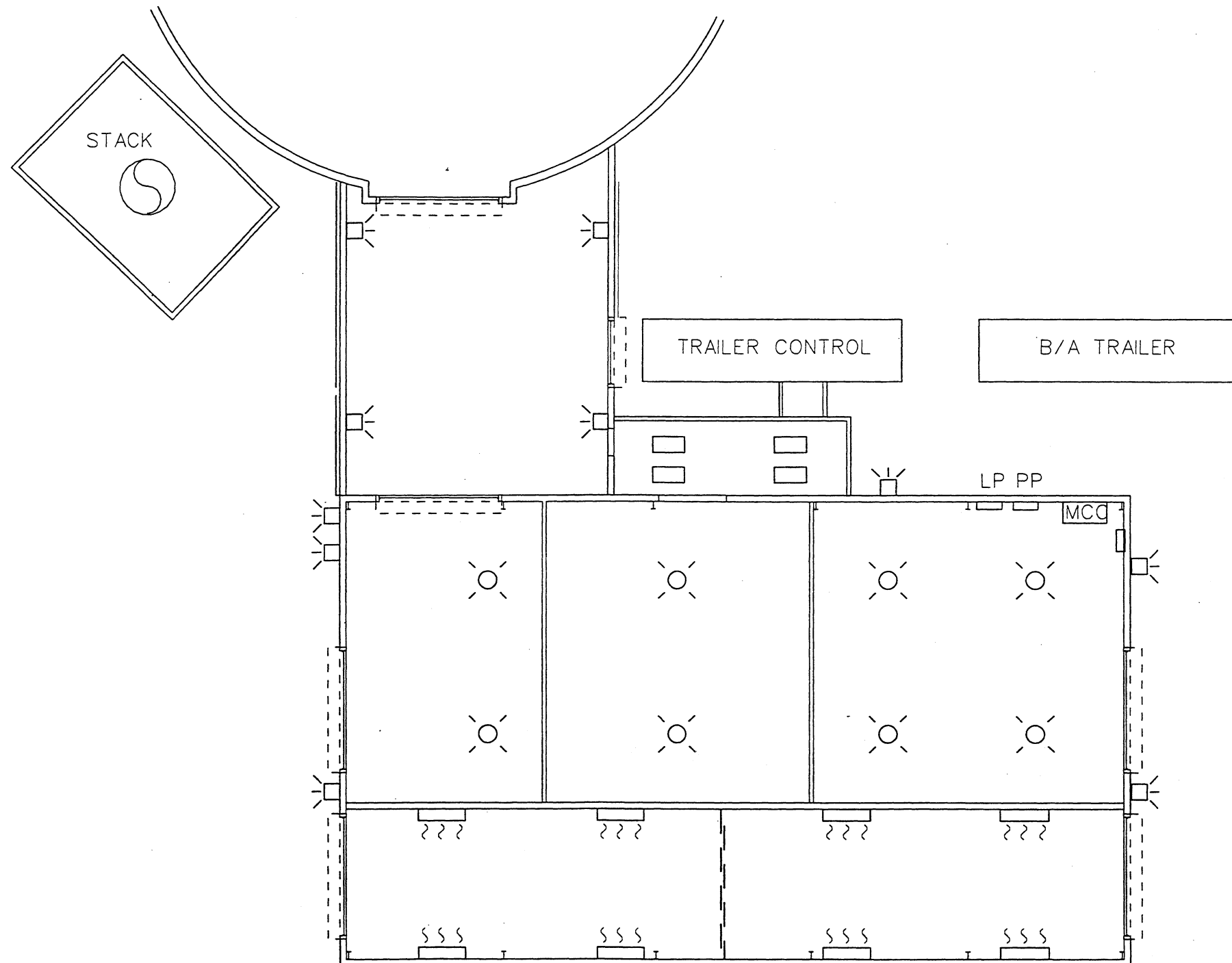
U.S. DEPARTMENT OF ENERGY

SILO 3 PROJECT  
SECTION





RES 4229  
DATE 04/09/01  
DRAWN RSO

SK-4229-03





# LIGHTING LEGEND

-  PENDANT
-  FLOOD
-  FLUORESCENT
-  INFRARED HEAT

## LIGHTING PLAN

NTS

1  
-

Fernald Environmental  
Management Project

FLUOR DANIEL  
**FERNALD**



U.S. DEPARTMENT OF ENERGY

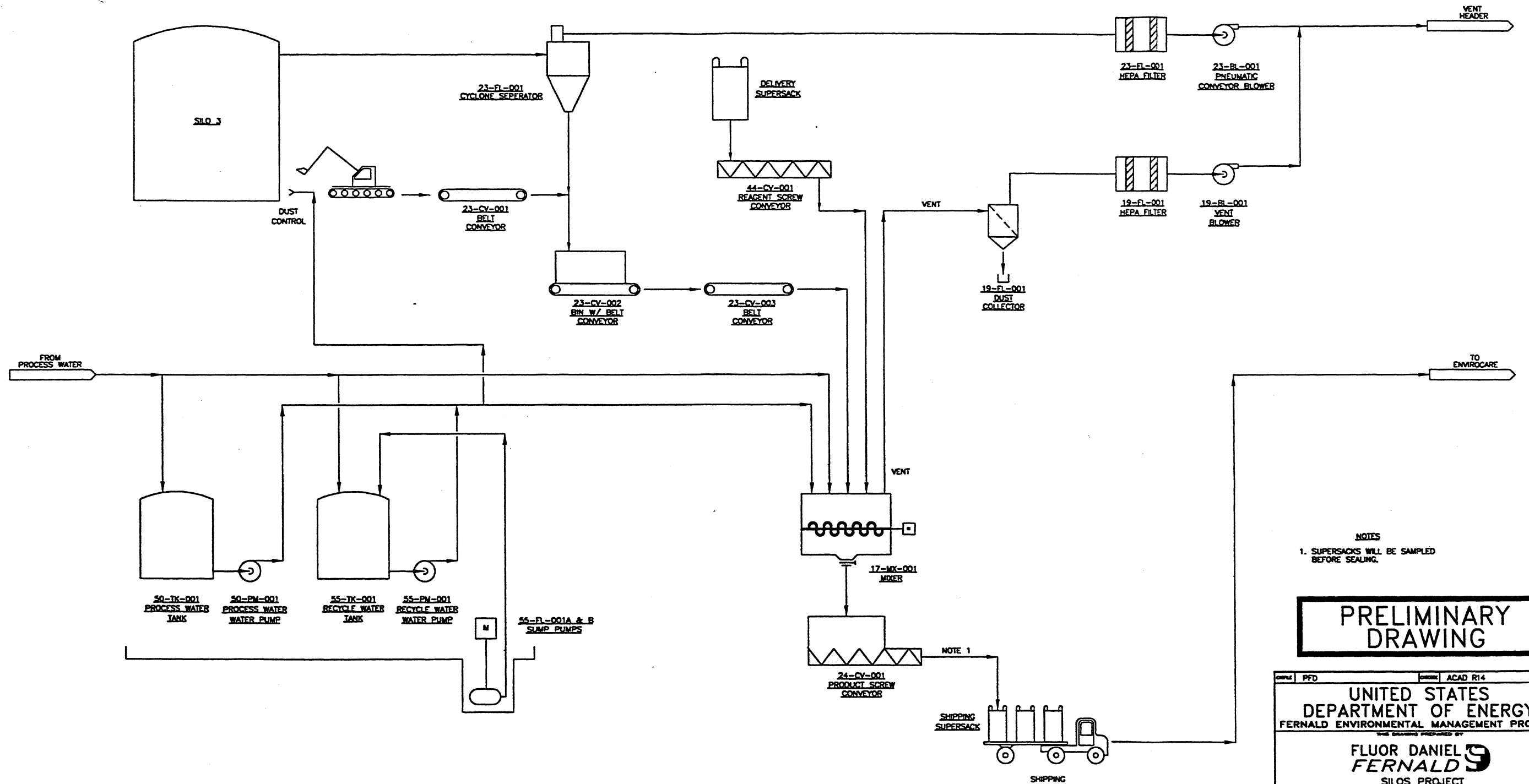
SILO 3 PROJECT  
LIGHTING PLAN

RES 4229  
DATE 04/09/01  
DRAWN RSO

SK-4229-04

FILE NAME: RES4229/SILO3PRO.DGN

50-TK-001 WATER TANK 50-PM-001 WATER PUMP 55-TK-001 RECYCLE WATER TANK 55-PM-001 RECYCLE WATER PUMP 55-FI-001A & B SUMP PUMPS 23-FI-001 CYCLONE SEPARATOR 23-CV-001 BELT CONVEYOR 23-CV-002 BIN W/ BELT CONVEYOR 23-CV-003 BELT CONVEYOR 44-CV-001 REAGENT SCREW CONVEYOR 17-MX-001 MIXER 24-CV-001 PRODUCT SCREW CONVEYOR 19-FI-001 DUST COLLECTOR 23-FI-001 HEPA FILTER 19-FI-001 HEPA FILTER 19-BL-001 VENT BLOWER 23-BL-001 PNEUMATIC CONVEYOR BLOWER



NOTES  
1. SUPERSACKS WILL BE SAMPLED  
BEFORE SEALING.

**PRELIMINARY  
DRAWING**

DATE	PFD	REVISION	ACAD R14
UNITED STATES DEPARTMENT OF ENERGY FERNALD ENVIRONMENTAL MANAGEMENT PROJECT			
DESIGNED BY <b>FLUOR DANIEL FERNALD</b> SILOS PROJECT CINCINNATI, OHIO DRAWING TITLE			
PROCESS FLOW DIAGRAM SILOS 3 CHEMICAL STABILIZATION			
DESIGNED BY J. THOMPSON	DATE 06/05/91	DESIGNED BY J. THOMPSON	DATE 06/05/91
APPROVED BY QUA	DATE 06/05/91	APPROVED BY QUA	DATE 06/05/91
PROJECT NO. 94X-5500-F-SK-XXXX		SHEET NO. 1	
PROJECT TITLE SILOS 3 CHEMICAL STABILIZATION		SHEET TITLE B	

DISTRIBUTION CODE: XXX ACAD INITIALS: JET DATE: 04/09/91

## **SECTION 2**

### **2.0 SCHEDULE**













Activity ID	Activity Description	Early Start	Early Finish	Orig Dur	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
<b>HS3AE SILO 3 START-UP/START-UP REVIEW</b>															
HS3E4120	PREPARE SILO 3 DRAFT FHAR	13JAN03	17MAR03	40											
HS3E0214	PREPARE SILO 3 OPERATING PROCEDURES	27JAN03	21APR03	48											
HS3E0244	PREPARE SILO 3 MAINTENANCE PLAN	27JAN03	21APR03	48											
HS3E3214	PREPARE SILO 3 SPECIFIC TQP	12FEB03	19MAR03	20											
HS3E0274	PREPARE SILO 3 STANDING ORDERS	04MAR03	05MAY03	36											
HS3E4130	FF REVIEW/REVISE SILO 3 DRAFT FHAR	18MAR03	07APR03	14											
HS3E3218	SILO 3 SPECIFIC TQP - INTERNAL REVIEW & COMMENT	20MAR03	14APR03	14											
HS3E4140	DOE-FF REVIEW SILO 3 DRAFT FHAR	08APR03	30APR03	14											
HS3E3222	SILO 3 SPECIFIC TQP - INCORP COMMENTS & FINALIZE	15APR03	07MAY03	14											
HS3E0216	FF/DOE-FF REVIEW SILO 3 OPERATING PROCEDURES	22APR03	12MAY03	12											
HS3E0246	FF/DOE-FF REVIEW SILO 3 MAINTENANCE PLAN	22APR03	12MAY03	12											
HS3E4150	INCORP DOE REVW COMMENTS & FINALIZE SILO 3 FHAR	01MAY03	14MAY03	9											
HS3E0276	FF/DOE-FF REVIEW SILO 3 STANDING ORDERS	06MAY03	27MAY03	12											
HS3E3226	APPROVE SILO 3 TQP	08MAY03	14MAY03	4											
HS3E0218	INCORP FF/DOE-FF COMMMNTS & REVISE OPS PROCEDURES	13MAY03	03JUN03	12											
HS3E0248	INCORP FF/DOE-FF COMNTS & REVISE MAINT PLAN	13MAY03	03JUN03	12											
HS3E0908	PREPARE SILO 3 SOT PROCEDURES	13MAY03	10JUL03	34											
HS3E4160	ISRC REVIEW SILO 3 FHAR	15MAY03	12JUN03	18											
HS3E3514	SILO 3 - DEVELOP LESSON PLANS	15MAY03	03JUL03	28											
HS3E0278	INCORP FF/DOE-FF COMNTS & REVISE STANDING ORDER	28MAY03	17JUN03	12											
HS3E0222	APPROVE SILO 3 OPERATING PROCEDURES	04JUN03	10JUN03	4											
HS3E0252	APPROVE SILO 3 MAINTENANCE PLAN	04JUN03	10JUN03	4											

<b>FLUOR FERNALD</b> © Primavera Systems, Inc.	Start Date 23JUN08 Finish Date 01DEC00 Data Date 10SEP01 16:47	01DEC00 BLCF - HS01	<b>SILOS PROJECT</b> <b>1.1.H.B SILO 3</b>	Sheet 5 of 11	Early Bar Progress Bar Critical Activity	Date Revision F07-025 F07-028 F07-059	Checked Approved

















## **SECTION 2**

### **3.0 MANPOWER PLANS**





<b>MPS #</b>	<b>1HB01</b>	<b>PROJECT MANAGEMENT</b>
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[illegible]

**MPS # 1HB02 DESIGN DOCUMENTATION - FERNALD**

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
751 BENCH-SCALE TESTING	04/16/2001	11/30/2001		xxx	xxx	xx																					
752 SILO 3 - CONCEPTUAL DESIGN	04/16/2001	06/11/2001		xxx																							
753 SILO 3 - ENG DESIGN PKG (PRELIM)	06/12/2001	09/13/2001		x	xxx																						
754 SILO 3 - STRUCTURAL EVALUATION	05/14/2001	08/08/2001		xx	xx																						
755 SILO 3 - ENG DESIGN PKG (FINAL)	09/17/2001	12/31/2001			x	xxx																					
756 SILO 3 - REMEDIAL DESIGN PACKAGE	06/12/2001	02/21/2002		x	xxx	xxx	xx																				
757 SILO 3 - PHAR	04/16/2001	11/27/2001		xxx	xxx	xx																					
758 SILO 3 - HEALTH & SAFETY PLAN/PSHRM	10/15/2001	12/13/2001		xxx																							
759 SILO 3 - TITLE III ENGINEERING	01/02/2002	03/27/2003					xxx	xxx	xxx	xxx	xxx																
Procurement	Buyer/Contracts Administrator		0.40	0	0	0.1	0.2	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Engineering & Design	Engineer		0.40	0	0	0.1	0.2	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Operations Labor	Engineer: Process & Startup		0.60	0	0	0.1	0.3	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Operations	Operations Manager		1.10	0	0	0	0	0.2	0.3	0.3	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Environmental	Environmental Scientist Rep.		1.20	0	0	0	0	0.3	0.3	0.3	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Environmental Safety & H	Fire Protection Rep.		0.30	0	0	0	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
General Labor	Hazwat		0.30	0	0	0	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Environmental Safety & H	Industrial Hygienist		0.80	0	0	0	0.1	0.3	0.3	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Lab	Chemist		1.60	0	0	0.2	0.8	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Lab	Lab Manager		0.20	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Transportation Labor	Motor Vehicle Operator		0.20	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Operations	Operations Manager		1.30	0	0	0	0	0.3	0.3	0.3	0.3	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0		
Environmental Safety & H	Rad Engineer		4.40	0	0	0.1	0.6	1.3	1.1	0.7	0.5	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0		
Environmental Safety & H	Rad Tech		0.20	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Environmental Safety & H	Safety Engineer		0.20	0	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Project Management	Tech/Program Support Rep.		1.50	0	0	0	0	0.3	0.4	0.4	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Project Management	Tech/Program Support Rep.		4.00	0	0	0	0	0	0.8	1	1	1	0.2	0	0	0	0	0	0	0	0	0	0	0	0		
Project Management	Tech/Program Support Rep.		1.50	0	0	0.2	0.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Waste Management	Waste Engineer		1.70	0	0	0.2	0.8	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Waste Management	Waste Engineer		2.30	0	0	0.1	0.2	0.5	0.5	0.5	0.5	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0		
Sheet Totals:			24.20	0.00	0.00	1.10	4.40	6.80	4.50	3.70	3.30	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

**MPS # 1HB02 DESIGN DOCUMENTATION - FERNALD**

**Sheet Totals:**



**MPS # 1HB08 CONCEPTUAL DESIGN - FERNALD**

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**MPS # 1HB09 PRELIMINARY DESIGN - FERNALD**

[illegible]

[illegible]

**MPS # 1HB09 PRELIMINARY DESIGN - FERNALD**

[illegible]

DRIVERS	START DATE	END DATE	TOT	FY 2001			FY 2002			FY 2003			FY 2004			FY 2005			FY 2006		
				Q1	Q2	Q3 Q4	Q1	Q2	Q3 Q4	Q1	Q2	Q3 Q4	Q1	Q2	Q3 Q4	Q1	Q2	Q3 Q4	Q1	Q2	Q3 Q4
				#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er
				#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	#Er	
Procurement	Buyer/Contracts Administrator		1.20	0	0	0	0	0	0	0.4	0.5	0.3	0	0	0	0	0	0	0	0	0
General Labor	Chemical Operator		0.30	0	0	0	0	0	0	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0
Construction	Construction Engineer		0.30	0	0	0	0	0	0	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0
Construction	Construction Engineer		2.50	0	0	0	0	0	0	0.9	1	0.6	0	0	0	0	0	0	0	0	0
Construction	Construction Engineer		0.40	0	0	0	0	0	0	0.1	0.2	0.1	0	0	0	0	0	0	0	0	0
Engineering & Design	Drafter/CAD Operator		0.30	0	0	0	0	0	0	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0
Engineering & Design	Engineer Civil		1.20	0	0	0	0	0	0	0.4	0.5	0.3	0	0	0	0	0	0	0	0	0
Engineering & Design	Engineer		1.20	0	0	0	0	0	0	0.4	0.5	0.3	0	0	0	0	0	0	0	0	0
Engineering & Design	Engineer		2.60	0	0	0	0	0	0	0.9	1	0.7	0	0	0	0	0	0	0	0	0
Engineering & Design	Engineer		2.60	0	0	0	0	0	0	0.9	1	0.7	0	0	0	0	0	0	0	0	0
Engineering & Design	Engineer		0.30	0	0	0	0	0	0	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0
Engineering & Design	Engineer		0.60	0	0	0	0	0	0	0.2	0.3	0.1	0	0	0	0	0	0	0	0	0
Engineering & Design	Engineer Piping/Mechanic		2.00	0	0	0	0	0	0	0.7	0.8	0.5	0	0	0	0	0	0	0	0	0
Operations Labor	Engineer: Process & Startup		0.80	0	0	0	0	0	0	0.3	0.3	0.2	0	0	0	0	0	0	0	0	0
Environmental	Environmental Protection Rep.		0.30	0	0	0	0	0	0	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0
Environmental Safety & H	Fire Protection Rep.		0.30	0	0	0	0	0	0	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0
Environmental Safety & H	Industrial Hygienist		0.50	0	0	0	0	0	0	0.2	0.2	0.1	0	0	0	0	0	0	0	0	0
Operations	Operations Manager		1.80	0	0	0	0	0	0	0.6	0.7	0.5	0	0	0	0	0	0	0	0	0
Operations	Operations Manager		0.50	0	0	0	0	0	0	0.2	0.2	0.1	0	0	0	0	0	0	0	0	0
Maintenance	Project Support Rep.		0.80	0	0	0	0	0	0	0.3	0.3	0.2	0	0	0	0	0	0	0	0	0
Maintenance	Project Support Rep.		0.80	0	0	0	0	0	0	0.3	0.3	0.2	0	0	0	0	0	0	0	0	0
Maintenance	Project Support Rep.		1.30	0	0	0	0	0	0	0.5	0.5	0.3	0	0	0	0	0	0	0	0	0
Procurement	Procur. & Contracting Mgr.		2.50	0	0	0	0	0	0	0.9	1	0.6	0	0	0	0	0	0	0	0	0
QA/QC	QA Engineer		1.20	0	0	0	0	0	0	0.4	0.5	0.3	0	0	0	0	0	0	0	0	0
QA/QC	QA Manager		0.30	0	0	0	0	0	0	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0
Environmental Safety & H	Rad Engineer		1.20	0	0	0	0	0	0	0.4	0.5	0.3	0	0	0	0	0	0	0	0	0
Project Management	Tech/Program Support Rep.		1.20	0	0	0	0	0	0	0.4	0.5	0.3	0	0	0	0	0	0	0	0	0
Project Management	Tech/Program Support Rep.		1.20	0	0	0	0	0	0	0.4	0.5	0.3	0	0	0	0	0	0	0	0	0
Project Management	Tech/Program Support Rep.		2.50	0	0	0	0	0	0	0.9	1	0.6	0	0	0	0	0	0	0	0	0

MPS #	1HB10	FINAL DESIGN - FERNALD

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**MPS # 1HB10 FINAL DESIGN - FERNALD**

[illegible]





MPS #	1HB11	TITLE III SUPPORT - FERNALD

[illegible]

# Manpower Planning Sheet (CR2)

MPS # 1HB03 CONSTRUCTION MGMT

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
				XXX XXX				X XXX XXX X				XXX XXX X															
760 SILO 3 - CONSTRUCTION IFB PACKAGES T	10/09/2001	03/21/2002	3.90	0	0	0	0	0	0	0	0.4	0.5	0.8	0.5	0.5	0.8	0.4	0	0	0	0	0	0	0	0	0	0
761 SILO 3 - CONSTRUCTION SUBCONTRACTS	03/25/2002	10/29/2002	3.50	0	0	0	0	0	0	0	0	0	0.8	1	1	0.7	0	0	0	0	0	0	0	0	0	0	0
762 SILO 3 - CONSTRUCTION START-UP SUPP	10/30/2002	04/08/2003	5.80	0	0	0	0	0	0	0	0.8	1	0.6	1	1	0.7	0.7	0	0	0	0	0	0	0	0	0	0
Procurement	Buyer/Contracts Administrator		5.00	0	0	0	0	0	0	0	0	0	1.6	1	1	0.6	0.8	0	0	0	0	0	0	0	0	0	0
Construction	Construction Coordinator		6.70	0	0	0	0	0	0	0	0.7	1	1.6	1	1	0.6	0.8	0	0	0	0	0	0	0	0	0	0
Construction	Construction Engineer		9.20	0	0	0	0	0	0	0	0.7	1	1.6	1	1	3.9	0	0	0	0	0	0	0	0	0	0	0
Construction	Construction Engineer		0.70	0	0	0	0	0	0	0	0	0	0.2	0.2	0.2	0.1	0	0	0	0	0	0	0	0	0	0	0
Construction	Construction Mgr.		0.70	0	0	0	0	0	0	0	0	0	0.2	0.2	0.2	0.1	0	0	0	0	0	0	0	0	0	0	0
Administration	Department Administrator		3.00	0	0	0	0	0	0	0	0.4	0.5	0.8	0.5	0.5	0.3	0	0	0	0	0	0	0	0	0	0	0
Engineering & Design	Engineer		0.40	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0
Environmental	Environmental Scientist Tech.		0.70	0	0	0	0	0	0	0	0.1	0.1	0.2	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0
Environmental Safety & H	Fire Protection Rep.		1.40	0	0	0	0	0	0	0	0.2	0.3	0.4	0.2	0.2	0.1	0	0	0	0	0	0	0	0	0	0	0
Environmental Safety & H	Industrial Hygienist		1.70	0	0	0	0	0	0	0	0	0	0.4	0.5	0.5	0.3	0	0	0	0	0	0	0	0	0	0	0
Lab	Chemist		5.90	0	0	0	0	0	0	0	0.7	1	1.5	1	1	0.7	0	0	0	0	0	0	0	0	0	0	0
Procurement	Procur. & Contracting Mgr.		5.60	0	0	0	0	0	0	0	0.4	0.3	1.4	1.3	1.3	0.9	0	0	0	0	0	0	0	0	0	0	0
QA/QC	QA Engineer		3.50	0	0	0	0	0	0	0	0	0	0.8	1	1	0.7	0	0	0	0	0	0	0	0	0	0	0
QA/QC	QA/QC Tech.		2.70	0	0	0	0	0	0	0	0.4	0.5	0.7	0.4	0.4	0.3	0	0	0	0	0	0	0	0	0	0	0
Environmental Safety & H	Rad Engineer		7.10	0	0	0	0	0	0	0	0	0	1.7	2	2	1.4	0	0	0	0	0	0	0	0	0	0	0
Environmental Safety & H	Rad Tech		4.10	0	0	0	0	0	0	0	0.4	0.5	1	0.8	0.8	0.6	0	0	0	0	0	0	0	0	0	0	0
Environmental Safety & H	Safety Engineer		2.50	0	0	0	0	0	0	0	0.7	1	0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project Management	Tech/Program Support Rep.		5.20	0	0	0	0	0	0	0	0	0	0.7	1	1	1.7	0.8	0	0	0	0	0	0	0	0	0	0
Project Management	Tech/Program Support Rep.		0.80	0	0	0	0	0	0	0	0.2	0.2	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waste Management	Waste Engineer		4.00	0	0	0	0	0	0	0	0.2	0.3	0.8	1	1	0.7	0	0	0	0	0	0	0	0	0	0	0
Waste Management	Waste Engineer		84.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.30	8.20	19.10	15.80	15.40	3.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sheet Totals:

MPS #	1HB03	CONSTRUCTION MGMT

[illegible]

## DRIVERS

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
766 SILO 3 - START-UP MANAGEMENT	03/25/2002	03/11/2003	2.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0.5	0.5	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**MPS # 1HB04 START-UP/START-UP REVIEW**

[illegible]

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Maintenance	Project Support Rep.		4.30	0	0	0	0	0	0	0	0	0	0	0	0.6	1	1	1.5	0.2	0	0	0	0	0	0	0	
Project Management	Program Mgr.		1.50	0	0	0	0	0	0	0	0	0	0	0	0.2	0.3	0.3	0.5	0.2	0	0	0	0	0	0	0	
QA/QC	QA Engineer		2.70	0	0	0	0	0	0	0	0	0	0	0	0.5	0.6	0.4	0.8	0.4	0	0	0	0	0	0	0	
Environmental Safety & H	Rad Engineer		2.60	0	0	0	0	0	0	0	0	0	0	0	0.4	0.5	0.5	0.7	0.5	0	0	0	0	0	0	0	
Environmental Safety & H	Rad Engineer		2.00	0	0	0	0	0	0	0	0	0	0	0	0.4	0.5	0.4	0.5	0.2	0	0	0	0	0	0	0	
Environmental Safety & H	Rad Supervisor/Manager		2.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	1	0.4	0	0	0	0	0	0	0	
Environmental Safety & H	Rad Tech		13.50	0	0	0	0	0	0	0	0	0	0	0	0	0	3.4	7	3.1	0	0	0	0	0	0	0	
Craft Labor	Rigger		4.10	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2	2	0.9	0	0	0	0	0	0	0	
Environmental Safety & H	Safety Engineer		1.80	0	0	0	0	0	0	0	0	0	0	0	0.1	0.2	0.1	1	0.4	0	0	0	0	0	0	0	
Administration	Technical Writer		3.50	0	0	0	0	0	0	0	0	0	0	0	0.7	0.8	0.6	1	0.4	0	0	0	0	0	0	0	
Project Management	Tech/Program Support Rep.		3.50	0	0	0	0	0	0	0	0	0	0	0	0.6	0.8	0.6	1.1	0.4	0	0	0	0	0	0	0	
Project Management	Tech/Program Support Rep.		7.70	0	0	0	0	0	0	0	0	0	0	0	1.4	2.5	1.8	1.1	0.9	0	0	0	0	0	0	0	
Transportation Labor	Transportation Laborer		4.10	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2	2	0.9	0	0	0	0	0	0	0	
Training	Training Representative		1.70	0	0	0	0	0	0	0	0	0	0	0	0.2	0.5	0.3	0.5	0.2	0	0	0	0	0	0	0	
Craft Labor	Welder		1.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.9	0.2	0	0	0	0	0	0	0	
Waste Management	Waste Engineer		0.20	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	
Waste Management	Waste Engineer		2.00	0	0	0	0	0	0	0	0	0	0	0	0.5	0.7	0.1	0.5	0.2	0	0	0	0	0	0	0	
Sheet Totals:				157.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.60	16.90	39.30	61.80	27.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

MPS #	1HB04	START-UP/START-UP REVIEW

[illegible]



# Manpower Planning Sheet (CR2)

MPS # 1HB05 REMEDIAL ACTION

DRIVERS		START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
776 SILO 3 - OPERATIONS		03/12/2003	02/02/2004														X	XXX	XXX	XXX	XX							
Procurement	Buyer/Contracts Administrator			4.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	1	1	1	0.7	0	0
General Labor	Chemical Operator			34.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.5	8	8	8	5.9	0	0
Craft Labor	Carpenter			1.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.3	0.3	0.3	0.2	0	0
Engineering & Design	Engineer			4.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	1	1	1	0.7	0	0
Craft Labor	Electrician			8.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.1	2	2	2	1.5	0	0
Environmental	Environmental Scientist Tech.			0.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.2	0.2	0.2	0.1	0	0
Environmental Safety & H	Fire Protection Rep.			0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0	0
General Labor	Hazwat			21.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.8	5	5	5	3.7	0	0
Transportation Labor	Heavy Equipment Operator			34.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.5	8	8	8	5.9	0	0
Environmental Safety & H	Industrial Hygienist			2.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0.5	0.5	0.4	0	0
Craft Labor	Instrument Mechanic			8.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.1	2	2	2	1.5	0	0
Operations Labor	Engineer: Process & Startup			8.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.1	2	2	2	1.5	0	0
Lab	Chemist			4.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	1	1	1	0.7	0	0
Craft Labor	Machinist			0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0	0
Craft Labor	Millwright			8.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.1	2	2	2	1.5	0	0
Maintenance	Maintenance Manager			6.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	1.5	1.5	1.5	1.1	0	0
Maintenance	Maintenance Rep.			2.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0.5	0.5	0.4	0	0
Transportation Labor	Motor Vehicle Operator			8.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.1	2	2	2	1.5	0	0
Craft Labor	Oiler (Maintenance)			0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0	0
Operations	Operations Manager			4.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1	1	1	0.7	0	0
Operations	Operations Manager			17.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.3	4	4	4	3	0	0
Craft Labor	Painter			0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0	0
Craft Labor	Pipefitter			8.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.1	2	2	2	1.5	0	0
Maintenance	Project Support Rep.			1.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.3	0.3	0.3	0.2	0	0
Maintenance	Project Support Rep.			1.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.3	0.3	0.3	0.2	0	0
Maintenance	Project Support Rep.			4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	1	1	1	0.8	0	0
Project Management	Program Mgr.			1.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.3	0.3	0.3	0.2	0	0
QA/QC	QA Engineer			4.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	1	1	1	0.7	0	0
Environmental Safety & H	Rad Engineer			4.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	1	1	1	0.8	0	0

MPS #	1HB05	REMEDIAL ACTION

[illegible]

# **Manpower Planning Sheet (CR2)**

MPS # 1HB05 REMEDIAL ACTION

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006									
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4						
Environmental Safety & H Rad Engineer			2.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.5	0.5	0.5	0.3	0	0	0	0	0	0	0	0	0	
Environmental Safety & H Rad Supervisor/Manager			4.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	1	1	1	0.7	0	0	0	0	0	0	0	0	0	
Environmental Safety & H Rad Tech			30.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.9	7	7	7	5.2	0	0	0	0	0	0	0	0	0	
Craft Labor Rigger			8.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.1	2	2	2	1.5	0	0	0	0	0	0	0	0	0	
Environmental Safety & H Safety Engineer			4.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	1	1	1	0.7	0	0	0	0	0	0	0	0	0	
Administration Technical Writer			0.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	
Project Management Tech/Program Support Rep.			4.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	1	1	1	0.7	0	0	0	0	0	0	0	0	0	0
Project Management Tech/Program Support Rep.			4.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	1	1	1	0.8	0	0	0	0	0	0	0	0	0	0
Transportation Labor Transportation Laborer			8.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.1	2	2	2	1.5	0	0	0	0	0	0	0	0	0	0
Craft Labor Welder			2.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0.5	0.5	0.4	0	0	0	0	0	0	0	0	0	0
Waste Management Waste Engineer			2.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0.5	0.5	0.4	0	0	0	0	0	0	0	0	0	0
Sheet Totals:			279.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.70	64.90	64.90	64.90	48.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MPS #	1HB05	REMEDIAL ACTION

[illegible]

# Manpower Planning Sheet (CR2)

MPS # 1HB07 SHUTDOWN

DRIVERS	FY 2001			FY 2002			FY 2003			FY 2004			FY 2005			FY 2006		
	TOT	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q4
779 SILO 3 - SAFE SHUTDOWN DOCUMENTATI																		
780 SILO 3 - SAFE SHUTDOWN																		
General Labor	5.80	0	0	0	0	0	0	0	0	0	0	0	0	0	2.1	3.7	0	0
Craft Labor	0.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0
Craft Labor	1.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.9	0	0
Engineering & Design	0.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0	0
Environmental	0.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.1	0	0
Environmental Safety & H Fire Protection Rep.	0.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
General Labor	3.60	0	0	0	0	0	0	0	0	0	0	0	0	0	1.3	2.3	0	0
Transportation Labor	5.80	0	0	0	0	0	0	0	0	0	0	0	0	0	2.1	3.7	0	0
Environmental Safety & H Industrial Hygienist	0.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.2	0	0
Craft Labor	1.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.9	0	0
Operations Labor	1.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.9	0	0
Lab	0.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0	0
Craft Labor	2.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	1.4	0	0
Maintenance	0.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0	0
Maintenance	0.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0	0
Transportation Labor	1.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.9	0	0
Craft Labor	0.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
Operations	0.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0	0
Operations	0.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.4	0	0
Craft Labor	0.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0
Craft Labor	1.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.9	0	0
Maintenance	0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.2	0	0
Maintenance	0.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.5	0	0
QA/QC	0.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0	0
Environmental Safety & H Rad Supervisor/Manager	0.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0	0
Environmental Safety & H Rad Tech	5.10	0	0	0	0	0	0	0	0	0	0	0	0	0	1.8	3.3	0	0
Craft Labor	1.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.9	0	0
Environmental Safety & H Safety Engineer	0.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.5	0	0

MPS #	1HB07	SHUTDOWN
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# Manpower Planning Sheet (CR2)

MPS # 1HB07 SHUTDOWN

DRIVERS	START DATE	END DATE	TOT	FY 2001				FY 2002				FY 2003				FY 2004				FY 2005				FY 2006			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Project Management	Tech/Program Support Rep.		1.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.9	0	0	0	0	0
Transportation Labor	Transportation Laborer		1.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.9	0	0	0	0	0
Craft Labor	Welder		0.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.2	0	0	0	0	0
Waste Management	Waste Engineer		0.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.2	0	0	0	0	0
<b>Sheet Totals:</b>				43.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.60	27.80	0.00	0.00	0.00	0.00	0.00

MPS #	1HB07	SHUTDOWN
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## **SECTION 2**

### **4.0 ESTIMATE**



**HS3AA**

**PROJECT MANAGEMENT**



## Fluor Fernald, Inc.

DATE: 7-Sep-01  
PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)PBS: OHFN07  
WBS: 1.1.H.B SILO 3  
CTRL ACCT: HS3A SILO 3  
CHARGE NO: HS3AA PROJECT MANAGEMENT  
COMMENTS: F07-025Resource: CLERKS  
Res Dept: 943  
Overtime: EOC: SAL

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	262.0	524.1	524.1	524.1	353.6	0.0	0.0	0.0	0.0	0.0
Cum Hours:	262.0	786.1	1,310.2	1,834.3	2,187.9	2,187.9	2,187.9	2,187.9	2,187.9	2,187.9
Yr Total Cost:	6,259	13,179	13,959	14,782	10,566	0	0	0	0	0
Cum Total Cost:	6,259	19,438	33,398	48,180	58,746	58,746	58,746	58,746	58,746	58,746

Resource: CONSTRUCTION MGR  
Res Dept: 943  
Overtime: EOC: SAL

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	265.2	349.4	349.4	235.8	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	265.2	614.6	964.0	1,199.8	1,199.8	1,199.8	1,199.8	1,199.8	1,199.8
Yr Total Cost:	0	17,310	24,156	25,580	18,283	0	0	0	0	0
Cum Total Cost:	0	17,310	41,465	67,045	85,328	85,328	85,328	85,328	85,328	85,328

Resource: DEPADM  
Res Dept: 943  
Overtime: EOC: SAL

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	265.2	349.4	349.4	235.8	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	265.2	614.6	964.0	1,199.8	1,199.8	1,199.8	1,199.8	1,199.8	1,199.8
Yr Total Cost:	0	8,852	12,352	13,081	9,350	0	0	0	0	0
Cum Total Cost:	0	8,852	21,204	34,285	43,634	43,634	43,634	43,634	43,634	43,634

Resource: ENGINEER  
Res Dept: 943  
Overtime: EOC: SAL

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	397.8	524.1	524.1	353.6	0.0	0.0	0.0	0.0	0.0

## Fluor Fernald, Inc.

DATE: 7-Sep-01  
PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)PBS: OHFN07  
WBS: 1.1.H.B SILO 3  
CTRL ACCT: HS3A SILO 3  
CHARGE NO: HS3AA PROJECT MANAGEMENT  
COMMENTS: F07-025

Cum Hours:	0.0	397.8	921.9	1,446.0	1,799.6	1,799.6	1,799.6	1,799.6	1,799.6	1,799.6	1,799.6
Yr Total Cost:	0	28,791	40,178	42,546	30,410	0	0	0	0	0	0
Cum Total Cost:	0	28,791	68,968	111,515	141,925	141,925	141,925	141,925	141,925	141,925	141,925

Resource:	MNTMGR	MAINTENANCE MGR	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	

Yr Hours:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Cum Hours:	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Total Cost:	262.0	524.1	524.1	524.1	353.6	0.0	0.0	0.0	0.0	0.0
Cum Total Cost:	262.0	786.1	1,310.2	1,834.3	2,187.9	2,187.9	2,187.9	2,187.9	2,187.9	2,187.9
	11,680	24,593	26,049	27,585	19,716	0	0	0	0	0
	11,680	36,273	62,322	89,906	109,623	109,623	109,623	109,623	109,623	109,623

Resource:	PRJMGR	PROJECT MANAGER	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	

Yr Hours:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Cum Hours:	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Total Cost:	1,966.3	2,795.2	2,795.2	2,795.2	1,886.1	0.0	0.0	0.0	0.0	0.0
Cum Total Cost:	1,966.3	4,761.5	7,556.7	10,351.9	12,238.0	12,238.0	12,238.0	12,238.0	12,238.0	12,238.0
	175,320	262,324	277,854	294,236	210,307	0	0	0	0	0
	175,320	437,644	715,497	1,009,733	1,220,040	1,220,040	1,220,040	1,220,040	1,220,040	1,220,040

Resource:	QACMGR	QA MANAGER	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	

Yr Hours:	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Cum Hours:	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Total Cost:	262.0	524.1	524.1	524.1	353.6	0.0	0.0	0.0	0.0	0.0
Cum Total Cost:	262.0	786.1	1,310.2	1,834.3	2,187.9	2,187.9	2,187.9	2,187.9	2,187.9	2,187.9
	14,101	29,690	31,448	33,302	23,803	0	0	0	0	0
	14,101	43,791	75,239	108,541	132,344	132,344	132,344	132,344	132,344	132,344

Resource:	S&HMGR	SAFETY & HEALTH MGR	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	

## Fluor Fernald, Inc.

PBS:	OHFN07	DATE:	7-Sep-01
WBS:	1.1.H.B	PROJECT MGR:	Robert Fellman
CTRL ACCT:	HS3A	CAM:	Robert Fellman
CHARGE NO:	HS3AA	PREPARED BY:	Karen Writz
COMMENTS:	F07-025	FISCAL YEAR:	FY01 - FY05
ESTIMATE SUPPORT WORKSHEET FOR ACTIVITY BASED ESTIMATING (1 FTE EQUALS 1747 HOURS)			

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Cum Hours:	262.0	524.1	524.1	524.1	353.6	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	262.0	786.1	1,310.2	1,834.3	2,187.9	2,187.9	2,187.9	2,187.9	2,187.9	2,187.9
Cum Total Cost:	14,523	30,578	32,389	34,298	24,515	0	0	0	0	0
	14,523	45,101	77,490	111,788	136,303	136,303	136,303	136,303	136,303	136,303

Resource: SECRETARIES EOC: LABOR  
Res Dept: 943 Class: SAL

Over time:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Cum Hours:	1,704.3	2,271.1	2,271.1	2,271.1	1,532.4	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	1,704.3	3,975.4	6,246.5	8,517.6	10,050.1	10,050.1	10,050.1	10,050.1	10,050.1	10,050.1
Cum Total Cost:	38,058	53,380	56,540	59,874	42,795	0	0	0	0	0
	38,058	91,438	147,979	207,852	250,648	250,648	250,648	250,648	250,648	250,648

Resource: TECH/PROG SUPT MGR EOC: LABOR  
Res Dept: 943 Class: SAL

Over time:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Cum Hours:	174.7	349.4	349.4	349.4	235.8	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	174.7	524.1	873.5	1,222.9	1,458.6	1,458.6	1,458.6	1,458.6	1,458.6	1,458.6
Cum Total Cost:	10,906	22,964	24,323	25,757	18,410	0	0	0	0	0
	10,906	33,870	58,193	83,950	102,360	102,360	102,360	102,360	102,360	102,360

Resource: TECH/PROG SUPT REP EOC: LABOR  
Res Dept: 943 Class: SAL

Over time:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Cum Hours:	1,966.3	2,795.2	2,795.2	2,795.2	1,886.1	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	1,966.3	4,761.5	7,556.7	10,351.9	12,238.0	12,238.0	12,238.0	12,238.0	12,238.0	12,238.0
Cum Total Cost:	102,171	152,875	161,925	171,473	122,561	0	0	0	0	0
	102,171	255,047	416,972	588,445	711,006	711,006	711,006	711,006	711,006	711,006

GRAND TOTALS:

Fluor Fernald, Inc.

PBS: OHFN07  
WBS: 1.1.H.B SILO 3  
CTRL ACCT: HS3A SILO 3  
CHARGE NO: HS3AA PROJECT MANAGEMENT  
COMMENTS: F07-025

DATE: 7-Sep-01  
PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

Yr Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:	6,859.7	11,235.5	11,530.2	11,530.2	7,780.1	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	6,859.7	18,095.2	29,625.4	41,155.6	48,935.7	48,935.7	48,935.7	48,935.7	48,935.7	48,935.7
Cum Total Cost:	373,019	644,536	701,173	742,514	530,716	0	0	0	0	0
	373,019	1,017,555	1,718,727	2,461,241	2,991,957	2,991,957	2,991,957	2,991,957	2,991,957	2,991,957

Robert Fellman

CAM

REVIEW TEAM

CONTROL TEAM

Karen Wintz



**HS3AB**

**DESIGN DOCUMENTATION – FLUOR FERNALD**



## 7

**ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)**

Resource:	FPRENG	FIRE PROTECTION ENG	Class:				EOC:	LABOR			
Res Dept:	943	Overtime:	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
			Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
			Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09
Yr Hours:			97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:			97	100.4	100.4	100.4	100.4	100.4	100.4	100.4	100.4
Yr Total Cost:			419	4,141	0	0	0	0	0	0	0

# Fluor Fernald, Inc.

PBS: 7  
WBS: 1.1.H.B SILO 3  
CTRL ACCT: HS3A SILO 3  
CHARGE NO: HS3AB REMEDIAL DESIGN  
COMMENTS: F07-025  
ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)  
DATE: 05-Sep-01  
PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

Cum Total Cost: 419 4,560 4,560 4,560 4,560 4,560 4,560 4,560

Resource: HAZWAT  
Res Dept: 943

HAZWAT  
Overtime:

Class: LABOR  
EOC: HOU

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	9.7	90.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	9.7	100.4	100.4	100.4	100.4	100.4	100.4	100.4	100.4	100.4
Yr Total Cost:	278	2,749	0	0	0	0	0	0	0	0
Cum Total Cost:	278	3,027	3,027	3,027	3,027	3,027	3,027	3,027	3,027	3,027

Resource: INDHYG  
Res Dept: 943

INDUSTRIAL HYGIENIST  
Overtime:

Class: LABOR  
EOC: SAL

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	78.4	262.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	78.4	340.4	340.4	340.4	340.4	340.4	340.4	340.4	340.4	340.4
Yr Total Cost:	3,639	12,802	0	0	0	0	0	0	0	0
Cum Total Cost:	3,639	16,441	16,441	16,441	16,441	16,441	16,441	16,441	16,441	16,441

Resource: LABCHIM  
Res Dept: 943

CHEMIST  
Overtime:

Class: LABOR  
EOC: SAL

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	472.6	222.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	472.6	695.4	695.4	695.4	695.4	695.4	695.4	695.4	695.4	695.4
Yr Total Cost:	18,320	9,087	0	0	0	0	0	0	0	0
Cum Total Cost:	18,320	27,406	27,406	27,406	27,406	27,406	27,406	27,406	27,406	27,406

Resource: LABMGR  
Res Dept: 943

LAB MANAGER  
Overtime:

Class: LABOR  
EOC: SAL

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	59.1	27.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	59.1	86.9	86.9	86.9	86.9	86.9	86.9	86.9	86.9	86.9
Yr Total Cost:	3,020	1,498	0	0	0	0	0	0	0	0
Cum Total Cost:	3,020	4,518	4,518	4,518	4,518	4,518	4,518	4,518	4,518	4,518

Resource: MAT300  
Res Dept: 943

MATERIAL OBJCLASS300  
Overtime:

Class: MATERIAL  
EOC: MAT

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Total Cost:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

# Fluor Fernald, Inc.

PBS: 7  
 WBS: 1.1.H.B SILO 3  
 CTRL ACCT: HS3A SILO 3  
 CHARGE NO: HS3AB REMEDIAL DESIGN  
 COMMENTS: F07-025  
 ESTIMATE SUPPORT WORKSHEET  
 FOR ACTIVITY BASED ESTIMATING  
 (1 FTE EQUALS 1747 HOURS)  
 DATE: 05-Sep-01  
 PROJECT MGR: Robert Fellman  
 CAM: Robert Fellman  
 PREPARED BY: Karen Wintz  
 FISCAL YEAR: FY01 - FY05

Yr Units: 13,440.0 6,560.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0  
 Cum Units: 13,440.0 20,000.0 20,000.0 20,000.0 20,000.0 20,000.0 20,000.0 20,000.0 20,000.0  
 Yr Total Cost: 13,440 6,737 0 0 0 0 0 0 0  
 Cum Total Cost: 13,440 20,177 20,177 20,177 20,177 20,177 20,177 20,177 20,177

Resource: MVOOPR MOTOR VEHICLE OPER EOC: LABOR  
 Res Dept: 943 Overtime: HOU  
 Class:  
 Yr Hours: Oct 00- Sep 01- Oct 01- Oct 02- Oct 03- Oct 04- Oct 05- Oct 06- Oct 07- Oct 08- Oct 09-  
 Cum Hours: 59.1 27.8 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0  
 Yr Total Cost: 59.1 86.9 86.9 86.9 86.9 86.9 86.9 86.9 86.9 86.9 86.9  
 Cum Total Cost: 1,705 2,551 2,551 2,551 2,551 2,551 2,551 2,551 2,551 2,551 2,551

Resource: OPRMGR OPERATIONS MGR EOC: LABOR  
 Res Dept: 943 Overtime: SAL  
 Class:  
 Yr Hours: Oct 00- Sep 01- Oct 01- Oct 02- Oct 03- Oct 04- Oct 05- Oct 06- Oct 07- Oct 08- Oct 09-  
 Cum Hours: 0.0 1,024.4 1,024.4 34.2 0.0 0.0 0.0 0.0 0.0 0.0 0.0  
 Yr Total Cost: 0 1,024.4 1,058.6 1,058.6 1,058.6 1,058.6 1,058.6 1,058.6 1,058.6 1,058.6 1,058.6  
 Cum Total Cost: 0 56,370 56,370 58,365 58,365 58,365 58,365 58,365 58,365 58,365 58,365

Resource: RADENG RAD ENGINEER EOC: LABOR  
 Res Dept: 943 Overtime: SAL  
 Class:  
 Yr Hours: Oct 00- Sep 01- Oct 01- Oct 02- Oct 03- Oct 04- Oct 05- Oct 06- Oct 07- Oct 08- Oct 09-  
 Cum Hours: 343.7 1,578.2 1,578.2 28.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0  
 Yr Total Cost: 343.7 1,921.9 1,950.4 1,950.4 1,950.4 1,950.4 1,950.4 1,950.4 1,950.4 1,950.4 1,950.4  
 Cum Total Cost: 16,222 78,410 94,632 96,133 96,133 96,133 96,133 96,133 96,133 96,133 96,133

Resource: RADTEC RAD TECH EOC: LABOR  
 Res Dept: 943 Overtime: SAL  
 Class:  
 Yr Hours: Oct 00- Sep 01- Oct 01- Oct 02- Oct 03- Oct 04- Oct 05- Oct 06- Oct 07- Oct 08- Oct 09-  
 Cum Hours: 59.1 27.8 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0  
 Yr Total Cost: 59.1 86.9 86.9 86.9 86.9 86.9 86.9 86.9 86.9 86.9 86.9  
 Cum Total Cost: 2,013 2,013 3,012 3,012 3,012 3,012 3,012 3,012 3,012 3,012 3,012

Resource: S&HENG SAFETY ENGINEER EOC: LABOR  
 Res Dept: 943 Overtime: SAL  
 Class:

# Fluor Fernald, Inc.

7

PBS:

WBS: 1.1.H.B SILO 3  
CTRL ACCT: HS3A SILO 3  
CHARGE NO: HS3AB REMEDIAL DESIGN

COMMENTS: F07-025

DATE: 05-Sep-01

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman

PREPARED BY: Karen Wintz

FISCAL YEAR: FY01 - FY05

## ESTIMATE SUPPORT WORKSHEET FOR ACTIVITY BASED ESTIMATING (1 FTE EQUALS 1747 HOURS)

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	131.9	131.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	131.9	131.9	131.9	131.9	131.9	131.9	131.9	131.9	131.9
Yr Total Cost:	0	6,902	0	0	0	0	0	0	0	0
Cum Total Cost:	0	6,902	6,902	6,902	6,902	6,902	6,902	6,902	6,902	6,902

Resource: **SERVSUB**  
Res Dept: **943**

SUBS  
Overtime:EOC:  
SUB

Class:

SUBCONTRACTORS

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Units:	0.0	16,400.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	16,400.0	16,400.0	16,400.0	16,400.0	16,400.0	16,400.0	16,400.0	16,400.0	16,400.0
Yr Total Cost:	0	50,000.0	50,000.0	50,000.0	50,000.0	50,000.0	50,000.0	50,000.0	50,000.0	50,000.0
Cum Total Cost:	0	50,443	50,443	50,443	50,443	50,443	50,443	50,443	50,443	50,443

Resource: **TPSREP**  
Res Dept: **943**

TECH/PROG SUPT REP  
Overtime:EOC:  
SAL

Class:

LABOR

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	413.6	2,585.1	79.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	413.6	2,998.6	3,078.5	3,078.5	3,078.5	3,078.5	3,078.5	3,078.5	3,078.5	3,078.5
Yr Total Cost:	21,489	141,383	4,626	0	0	0	0	0	0	0
Cum Total Cost:	21,489	162,872	167,498	167,498	167,498	167,498	167,498	167,498	167,498	167,498

Resource: **WSTENG**  
Res Dept: **943**

WASTE ENGINEER  
Overtime:EOC:  
SAL

Class:

LABOR

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	590.8	1,132.0	28.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	590.8	1,722.8	1,751.4	1,751.4	1,751.4	1,751.4	1,751.4	1,751.4	1,751.4	1,751.4
Yr Total Cost:	30,149	60,806	1,623	0	0	0	0	0	0	0
Cum Total Cost:	30,149	90,954	92,577	92,577	92,577	92,577	92,577	92,577	92,577	92,577

GRAND TOTALS:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	2,509.2	7,908.3	188.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	2,509.2	10,417.5	10,605.8	10,605.8	10,605.8	10,605.8	10,605.8	10,605.8	10,605.8	10,605.8
Yr Total Cost:	167,291	433,599	10,544	0	0	0	0	0	0	0
Cum Total Cost:	167,291	600,890	611,434	611,434	611,434	611,434	611,434	611,434	611,434	611,434

CAM:

Robert Fellman

CONTROL TEAM:

Karen Wintz

**HS3AK**

**CONCEPTUAL DESIGN – FLUOR FERNALD**





## 7

WBS:	1.1.H.B	SILO 3
CTRL ACCT:	HS3A	SILO 3
CHARGE NO:	HS3AK	CONCEPTUAL DESIGN - FFI
COMMENTS:	F07-025	

**ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)**

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Winiz  
FISCAL YEAR: FY01 - FY05

[illegible]

PBS: 7

WBS:	1.1.H.B	SILO 3
CTRL ACCT:	HS3A	SILO 3
CHARGE NO:	HS3AK	CONCEPTUAL DESIGN - FFI
COMMENTS:	F07-025	

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

[illegible][illegible][illegible]

# Fluor Fernald, Inc.

PBS: 7

DATE: SEP 5, 2001

WBS: 1.1.H.B SILO 3

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)PROJECT MGR: Robert Fellman  
CAM: Robert Fellman

CTRL ACCT: HS3A SILO 3

PREPARED BY: Karen Wintz

CHARGE NO: HS3AK

FISCAL YEAR: FY01 - FY05

CONCEPTUAL DESIGN - FFI

COMMENTS: F07-025

Yr Hours: 122.6 284.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0  
 Cum Hours: 122.6 406.7 406.7 406.7 406.7 406.7 406.7 406.7 406.7 406.7  
 Yr Total Cost: 5,692 13,881 0 0 0 0 0 0 0 0  
 Cum Total Cost: 5,692 19,574 19,574 19,574 19,574 19,574 19,574 19,574 19,574 19,574

**Resource: ODCTRLV**  
**Res Dept: 943**  
**Class:**  
**TRAVEL RESOURCE**  
**Overtime:**  
 Oct 00- Sep 01 8,774 29,546 29,546 29,546 29,546 29,546 29,546 29,546 29,546 29,546  
 Yr Units: 8,774 29,546 29,546 29,546 29,546 29,546 29,546 29,546 29,546 29,546  
 Cum Units: 8,774 29,546 29,546 29,546 29,546 29,546 29,546 29,546 29,546 29,546  
 Yr Total Cost: 8,774 29,546 29,546 29,546 29,546 29,546 29,546 29,546 29,546 29,546  
 Cum Total Cost: 8,774 29,546 29,546 29,546 29,546 29,546 29,546 29,546 29,546 29,546

**Resource: OPRMGR**  
**Res Dept: 943**  
**Class:**  
**OPERATIONS MGR**  
**Overtime:**  
 Oct 00- Sep 01 286.1 949.0 949.0 949.0 949.0 949.0 949.0 949.0 949.0 949.0  
 Yr Hours: 286.1 949.0 949.0 949.0 949.0 949.0 949.0 949.0 949.0 949.0  
 Cum Hours: 286.1 949.0 949.0 949.0 949.0 949.0 949.0 949.0 949.0 949.0  
 Yr Total Cost: 14,959 51,437 51,437 51,437 51,437 51,437 51,437 51,437 51,437 51,437  
 Cum Total Cost: 14,959 51,437 51,437 51,437 51,437 51,437 51,437 51,437 51,437 51,437

**Resource: PJSREP**  
**Res Dept: 943**  
**Class:**  
**PROJECT SUPPORT REP**  
**Overtime:**  
 Oct 00- Sep 01 449.6 1,041.7 1,491.3 1,491.3 1,491.3 1,491.3 1,491.3 1,491.3 1,491.3 1,491.3  
 Yr Hours: 449.6 1,041.7 1,491.3 1,491.3 1,491.3 1,491.3 1,491.3 1,491.3 1,491.3 1,491.3  
 Cum Hours: 449.6 1,041.7 1,491.3 1,491.3 1,491.3 1,491.3 1,491.3 1,491.3 1,491.3 1,491.3  
 Yr Total Cost: 18,331 44,703 63,034 63,034 63,034 63,034 63,034 63,034 63,034 63,034  
 Cum Total Cost: 18,331 63,034 63,034 63,034 63,034 63,034 63,034 63,034 63,034 63,034

**Resource: QACMGR**  
**Res Dept: 943**  
**Class:**  
**QA MANAGER**  
**Overtime:**  
 Oct 00- Sep 01 81.8 189.4 271.2 271.2 271.2 271.2 271.2 271.2 271.2 271.2  
 Yr Hours: 81.8 189.4 271.2 271.2 271.2 271.2 271.2 271.2 271.2 271.2  
 Cum Hours: 81.8 189.4 271.2 271.2 271.2 271.2 271.2 271.2 271.2 271.2  
 Yr Total Cost: 4,400 10,729 15,129 15,129 15,129 15,129 15,129 15,129 15,129 15,129  
 Cum Total Cost: 4,400 15,129 15,129 15,129 15,129 15,129 15,129 15,129 15,129 15,129

**Resource: RADENG**  
**Res Dept: 943**  
**Class:**  
**RAD ENGINEER**  
**Overtime:**  
 Oct 00- Sep 01 4.000 15.129 15.129 15.129 15.129 15.129 15.129 15.129 15.129 15.129  
 Yr Hours: 4.000 15.129 15.129 15.129 15.129 15.129 15.129 15.129 15.129 15.129  
 Cum Hours: 4.000 15.129 15.129 15.129 15.129 15.129 15.129 15.129 15.129 15.129  
 Yr Total Cost: 4,400 10,729 15,129 15,129 15,129 15,129 15,129 15,129 15,129 15,129  
 Cum Total Cost: 4,400 15,129 15,129 15,129 15,129 15,129 15,129 15,129 15,129 15,129

~~Fluor Fernald, Inc.~~

PBS: 7

DATE: SEP 5, 2001

WBS:	1.1.H.B	SILO 3
CTRL ACCT:	HS3A	SILO 3
CHARGE NO:	HS3AK	CONCEPTUAL DESIGN - FFI

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

[illegible]

Resource:	SERVSUB	SUBS	EOC:	SUBCONTRACTORS
Res Dept:	943	Overtime:	SUB	

[illegible]

Resource: **TPSREP**  
Res Dept: **943**  
TECH/PROG SUPT REP  
Overline:  
EOC: **SAL**  
Class:  
LABOR

[illegible]

Resource: **WTENG**      **WASTE ENGINEER**      **EOC:** **LABOR**  
Res Dept: **943**      **Overtime:** **SAL**      **Class:**

[illegible]

Resource: WSTMGR  
Res Dept: 943  
Class:  
WASTE ENGINEER MGR  
EOC:  
SAL  
LABOR

[illegible]

**GRAND TOTALS:**

## Fluor Fernald, Inc.

PBS: 7

WBS: 1.1.H.B SILO 3  
CTRL ACCT: HS3A SILO 3CHARGE NO: HS3AK CONCEPTUAL DESIGN - FFI  
COMMENTS: F07-025DATE: SEP 5, 2001  
PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Cum Hours:	4,700.6	10,890.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	4,700.6	15,591.1	15,591.1	15,591.1	15,591.1	15,591.1	15,591.1	15,591.1	15,591.1	15,591.1
Cum Total Cost:	366,271	885,353	0	0	0	0	0	0	0	0
	366,271	1,251,624	1,251,624	1,251,624	1,251,624	1,251,624	1,251,624	1,251,624	1,251,624	1,251,624

Robert Fellman

CAM

CONTROL TEAM

Karen Wintz



**HS3AL**

**CONCEPTUAL DESIGN - JACOBS**





# Fluor Fernald, Inc.

7

WBS: 1.1.HB SILO 3  
 CTRL ACCT: HS3A SILO 3  
 CHARGE NO: HS3AL CONCEPTUAL DESIGN - JACOBS  
 COMMENTS: F07-025 F07-060  
 ESTIMATE SUPPORT WORKSHEET  
 FOR ACTIVITY BASED ESTIMATING  
 \*\*\* STATED IN FY01 DOLLARS \*\*\*  
 (1 FTE EQUALS 1747 HOURS)  
 DATE: MAY 8, 2001  
 PROJECT MGR: Robert Fellman  
 CAM: Robert Fellman  
 PREPARED BY: Karen Wintz  
 FISCAL YEAR: FY01 - FY05

Resource: SERV SUB SUBS SUBS  
 Res Dept: 943 Overtime: JEG Class: SUBSUBCONTRACTORS

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Units:	379,617.8	875,051.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	379,617.8	1,254,669.0	1,254,669.0	1,254,669.0	1,254,669.0	1,254,669.0	1,254,669.0	1,254,669.0	1,254,669.0	1,254,669.0
Yr Total Cost:	379,618	898,678	0	0	0	0	0	0	0	0
Cum Total Cost:	379,618	1,278,295	1,278,295	1,278,295	1,278,295	1,278,295	1,278,295	1,278,295	1,278,295	1,278,295

## GRAND TOTALS:

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Total Cost:	379,618	898,678	0	0	0	0	0	0	0	0
Cum Total Cost:	379,618	1,278,295	1,278,295	1,278,295	1,278,295	1,278,295	1,278,295	1,278,295	1,278,295	1,278,295

CAM

Robert Fellman

CONTROL TEAM





**HS3AM**

**PRELIMINARY DESIGN – FLUOR FERNALD**



# Fluor Fernald, Inc.

7

DATE: 5-Sep-01

## ESTIMATE SUPPORT WORKSHEET FOR ACTIVITY BASED ESTIMATING (1 FTE EQUALS 1747 HOURS)

 PROJECT MGR: Robert Fellman  
 CAM: Robert Fellman  
 PREPARED BY: Karen Wintz  
 FISCAL YEAR: FY01 - FY05

 PBS: 7  
 WBS: 1.1.HB SILO 3  
 CTRL ACCT: HS3A SILO 3  
 CHARGE NO: HS3AM PRELIMINARY DESIGN - FFI  
 COMMENTS: F07-02/5

<b>Resource:</b>	<b>BUYCON</b>	<b>BUYER/CONTRACTS ADMIN</b>	<b>Class:</b>	<b>EOC:</b>	<b>LABOR</b>
<b>Res Dept:</b>	<b>943</b>	<b>Overtime:</b>	<b>SAL</b>		
Yr Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05
Cum Hours:	0.0 485.9	0.0 485.9	0.0 485.9	0.0 485.9	0.0 485.9
Yr Total Cost:	0 21,431	0 21,431	0 21,431	0 21,431	0 21,431
Cum Total Cost:	0	21,431	21,431	21,431	21,431

<b>Resource:</b>	<b>CHMOPR</b>	<b>CHEMICAL OPERATOR</b>	<b>Class:</b>	<b>EOC:</b>	<b>LABOR</b>
<b>Res Dept:</b>	<b>943</b>	<b>Overtime:</b>	<b>HOU</b>		
Yr Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05
Cum Hours:	0.0 48.6	0.0 48.6	0.0 48.6	0.0 48.6	0.0 48.6
Yr Total Cost:	0 1,596	0 1,596	0 1,596	0 1,596	0 1,596
Cum Total Cost:	0	1,596	1,596	1,596	1,596

<b>Resource:</b>	<b>CNSENG</b>	<b>CONSTRUCTION ENG</b>	<b>Class:</b>	<b>EOC:</b>	<b>LABOR</b>
<b>Res Dept:</b>	<b>943</b>	<b>Overtime:</b>	<b>SAL</b>		
Yr Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05
Cum Hours:	0.0 631.7	0.0 631.7	0.0 631.7	0.0 631.7	0.0 631.7
Yr Total Cost:	0 36,238	0 36,238	0 36,238	0 36,238	0 36,238
Cum Total Cost:	0	36,238	36,238	36,238	36,238

<b>Resource:</b>	<b>DRFCAD</b>	<b>DRAFTER/CAD OPERATOR</b>	<b>Class:</b>	<b>EOC:</b>	<b>LABOR</b>
<b>Res Dept:</b>	<b>943</b>	<b>Overtime:</b>	<b>SAL</b>		
Yr Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05
Cum Hours:	0.0 97.2	0.0 97.2	0.0 97.2	0.0 97.2	0.0 97.2
Yr Total Cost:	0 3,191	0 3,191	0 3,191	0 3,191	0 3,191
Cum Total Cost:	0	3,191	3,191	3,191	3,191

<b>Resource:</b>	<b>ENGCVL</b>	<b>ENGINEER CIVIL</b>	<b>Class:</b>	<b>EOC:</b>	<b>LABOR</b>
<b>Res Dept:</b>	<b>943</b>	<b>Overtime:</b>	<b>SAL</b>		
Yr Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05
Cum Hours:	0.0 243.0	0.0 243.0	0.0 243.0	0.0 243.0	0.0 243.0
Yr Total Cost:	0 13,907	0 13,907	0 243.0	0 243.0	0 243.0
Cum Total Cost:	0	13,907	243.0	243.0	243.0

# Fluor Fernald, Inc.

PBS: 7  
WBS: 1.1.H.B SILO 3  
CTRL ACCT: HS3A SILO 3  
CHARGE NO: HS3AM PRELIMINARY DESIGN - FFI  
COMMENTS: F07-025  
ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)  
DATE: 5-Sep-01  
PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

Cum Total Cost: 0 13,907 13,907 13,907 13,907 13,907 13,907 13,907

Resource: ENGINEER  
Res Dept: 943  
EOC: SAL  
Class: LABOR

Yr Hours: Oct 00- Sep 01 0.0 1,409.2 0.0 0.0 0.0 0.0 0.0 0.0  
Cum Hours: 0.0 1,409.2 1,409.2 1,409.2 1,409.2 1,409.2 1,409.2 1,409.2  
Yr Total Cost: 0 101,991 0 0 0 0 0 0  
Cum Total Cost: 0 101,991 101,991 101,991 101,991 101,991 101,991 101,991

Resource: ENGINEER MECH/PIPING  
Res Dept: 943  
EOC: SAL  
Class: LABOR

Yr Hours: Oct 00- Sep 01 0.0 97.2 0.0 0.0 0.0 0.0 0.0 0.0  
Cum Hours: 0.0 97.2 97.2 97.2 97.2 97.2 97.2 97.2  
Yr Total Cost: 0 6,361 6,361 6,361 6,361 6,361 6,361 6,361  
Cum Total Cost: 0 6,361 6,361 6,361 6,361 6,361 6,361 6,361

Resource: ENGINEER PROCESS/STARTUP  
Res Dept: 943  
EOC: SAL  
Class: LABOR

Yr Hours: Oct 00- Sep 01 0.0 145.8 0.0 0.0 0.0 0.0 0.0 0.0  
Cum Hours: 0.0 145.8 145.8 145.8 145.8 145.8 145.8 145.8  
Yr Total Cost: 0 8,590 8,590 8,590 8,590 8,590 8,590 8,590  
Cum Total Cost: 0 8,590 8,590 8,590 8,590 8,590 8,590 8,590

Resource: ENVIR PROTECTION REP  
Res Dept: 943  
EOC: SAL  
Class: LABOR

Yr Hours: Oct 00- Sep 01 0.0 97.2 0.0 0.0 0.0 0.0 0.0 0.0  
Cum Hours: 0.0 97.2 97.2 97.2 97.2 97.2 97.2 97.2  
Yr Total Cost: 0 4,945 4,945 4,945 4,945 4,945 4,945 4,945  
Cum Total Cost: 0 4,945 4,945 4,945 4,945 4,945 4,945 4,945

Resource: FIRE PROTECTION ENG  
Res Dept: 943  
EOC: SAL  
Class: LABOR

Yr Hours: Oct 00- Sep 01 0.0 97.2 0.0 0.0 0.0 0.0 0.0 0.0  
Cum Hours: 0.0 97.2 97.2 97.2 97.2 97.2 97.2 97.2  
Yr Total Cost: 0 4,945 4,945 4,945 4,945 4,945 4,945 4,945  
Cum Total Cost: 0 4,945 4,945 4,945 4,945 4,945 4,945 4,945

# Fluor Fernald, Inc.

PBS: 7

DATE: 5-Sep-01

WBS: 1.1.H.B SILO 3

PROJECT MGR: Robert Fellman

CTRL ACCT: HS3A SILO 3

CAM: Robert Fellman

CHARGE NO: HS3AM PRELIMINARY DESIGN - FFI

PREPARED BY: Karen Wintz

COMMENTS: F07-025

FISCAL YEAR: FY01 - FY05

## ESTIMATE SUPPORT WORKSHEET FOR ACTIVITY BASED ESTIMATING (1 FTE EQUALS 1747 HOURS)

	Yr Hours:	0.0	97.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	97.2	97.2	97.2	97.2	97.2	97.2	97.2	97.2	97.2	97.2	97.2	97.2	97.2	97.2	97.2	97.2	97.2
Yr Total Cost:	0	4,438	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	4,438	4,438	4,438	4,438	4,438	4,438	4,438	4,438	4,438	4,438	4,438	4,438	4,438	4,438	4,438	4,438	4,438

Resource:	INDHYG	INDUSTRIAL HYGIENIST	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	145.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	145.8	145.8	145.8	145.8	145.8	145.8	145.8	145.8	145.8
Yr Total Cost:	0	7,123	0	0	0	0	0	0	0	0
Cum Total Cost:	0	7,123	7,123	7,123	7,123	7,123	7,123	7,123	7,123	7,123

Resource:	ODCTRVL	TRAVEL RESOURCE	EOC:	ODC
Res Dept:	943	Overtime:	ODC	

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Units:	0.0	27,697.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	27,697.0	27,697.0	27,697.0	27,697.0	27,697.0	27,697.0	27,697.0	27,697.0	27,697.0
Yr Total Cost:	0	28,445	0	0	0	0	0	0	0	0
Cum Total Cost:	0	28,445	28,445	28,445	28,445	28,445	28,445	28,445	28,445	28,445

Resource:	OPRMGR	OPERATIONS MGR	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	437.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	437.3	437.3	437.3	437.3	437.3	437.3	437.3	437.3	437.3
Yr Total Cost:	0	24,066	0	0	0	0	0	0	0	0
Cum Total Cost:	0	24,066	24,066	24,066	24,066	24,066	24,066	24,066	24,066	24,066

Resource:	PJSREP	PROJECT SUPPORT REP	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	534.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	534.5	534.5	534.5	534.5	534.5	534.5	534.5	534.5	534.5
Yr Total Cost:	0	22,938	0	0	0	0	0	0	0	0
Cum Total Cost:	0	22,938	22,938	22,938	22,938	22,938	22,938	22,938	22,938	22,938

Resource:	PURMGR	PROC & CONTRACT MGR	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	

# Fluor Fernald, Inc.

PBS: 7

WBS: 1.1.H.B SILO 3  
 CTRL ACCT: HS3A SILO 3  
 CHARGE NO: HS3AM PRELIMINARY DESIGN - FFI  
 COMMENTS: F07-025

DATE: 5-Sep-01  
 PROJECT MGR: Robert Fellman  
 CAM: Robert Fellman  
 PREPARED BY: Karen Wintz  
 FISCAL YEAR: FY01 - FY05

## ESTIMATE SUPPORT WORKSHEET FOR ACTIVITY BASED ESTIMATING (1 FTE EQUALS 1747 HOURS)

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	485.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	485.9	485.9	485.9	485.9	485.9	485.9	485.9	485.9	485.9
Yr Total Cost:	0	32,377	0	0	0	0	0	0	0	0
Cum Total Cost:	0	32,377	32,377	32,377	32,377	32,377	32,377	32,377	32,377	32,377

Resource: QACENG  
 Res Dept: 943

QA ENGINEER  
 Overtime:

Class: LABOR

EOC: SAL

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	485.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	485.9	485.9	485.9	485.9	485.9	485.9	485.9	485.9	485.9
Yr Total Cost:	0	23,508	0	0	0	0	0	0	0	0
Cum Total Cost:	0	23,508	23,508	23,508	23,508	23,508	23,508	23,508	23,508	23,508

Resource: QACMGR  
 Res Dept: 943

QA MANAGER  
 Overtime:

Class: LABOR

EOC: SAL

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	48.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6
Yr Total Cost:	0	2,753	0	0	0	0	0	0	0	0
Cum Total Cost:	0	2,753	2,753	2,753	2,753	2,753	2,753	2,753	2,753	2,753

Resource: RADENG  
 Res Dept: 943

RAD ENGINEER  
 Overtime:

Class: LABOR

EOC: SAL

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	243.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	243.0	243.0	243.0	243.0	243.0	243.0	243.0	243.0	243.0
Yr Total Cost:	0	12,071	0	0	0	0	0	0	0	0
Cum Total Cost:	0	12,071	12,071	12,071	12,071	12,071	12,071	12,071	12,071	12,071

Resource: SERVSUB  
 Res Dept: 943

SUBS  
 Overtime:

Class: SUBCONTRACTORS

EOC: SUB

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Units:	0.0	113,082.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	113,082.3	113,082.3	113,082.3	113,082.3	113,082.3	113,082.3	113,082.3	113,082.3	113,082.3
Yr Total Cost:	0	116,136	0	0	0	0	0	0	0	0
Cum Total Cost:	0	116,136	116,136	116,136	116,136	116,136	116,136	116,136	116,136	116,136



# Fluor Fernald, Inc.

PBS: 7

WBS: 1.1.H.B SILO 3

CTRL ACCT: HS3A SILO 3

CHARGE NO: HS3AM PRELIMINARY DESIGN - FFI

COMMENTS: F07-025

DATE: 5-Sep-01

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman

PREPARED BY: Karen Wintz

FISCAL YEAR: FY01 - FY05

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)Resource: TPSREP  
Res Dept: 943TECH/PROG SUPT REP  
Overtime:

Class:

EOC:  
SAL

LABOR

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	1,457.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	1,457.8	1,457.8	1,457.8	1,457.8	1,457.8	1,457.8	1,457.8	1,457.8	1,457.8
Yr Total Cost:	0	79,729	0	0	0	0	0	0	0	0
Cum Total Cost:	0	79,729	79,729	79,729	79,729	79,729	79,729	79,729	79,729	79,729

Resource: WSTENG  
Res Dept: 943WASTE ENGINEER  
Overtime:

Class:

EOC:  
SAL

LABOR

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	243.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	243.0	243.0	243.0	243.0	243.0	243.0	243.0	243.0	243.0
Yr Total Cost:	0	13,050	0	0	0	0	0	0	0	0
Cum Total Cost:	0	13,050	13,050	13,050	13,050	13,050	13,050	13,050	13,050	13,050

Resource: WSTMGR  
Res Dept: 943WASTE ENGINEER MGR  
Overtime:

Class:

EOC:  
SAL

LABOR

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	48.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6
Yr Total Cost:	0	2,814	0	0	0	0	0	0	0	0
Cum Total Cost:	0	2,814	2,814	2,814	2,814	2,814	2,814	2,814	2,814	2,814

GRAND TOTALS:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	7,483.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	7,483.3	7,483.3	7,483.3	7,483.3	7,483.3	7,483.3	7,483.3	7,483.3	7,483.3
Yr Total Cost:	0	567,696	0	0	0	0	0	0	0	0
Cum Total Cost:	0	567,696	567,696	567,696	567,696	567,696	567,696	567,696	567,696	567,696

CAM

Robert Fellman

CONTROL TEAM

Robert Fellman



**HS3AN**

**PRELIMINARY DESIGN - JACOBS**



~~Fluor Fernald, Inc.~~

PBS:				7
WBS:	1.1.H.B	SILO 3		
CTRL ACCT:	HS3A	SILO 3		
CHARGE NO:	HS3AN			
COMMENTS:	F07-025	PRELIMINARY DESIGN-JACOBS	F07-060	

**ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)**

DATE: SEP 5, 2001  
PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

[illegible]

CAM Robert Fellman

CONTROL TEAM *[Signature]*



**HS3AP**

**FINAL DESIGN – FLUOR FERNALD**





# Fluor Fernald, Inc.

PBS: 7

DATE: SEP 5, 2001

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTEE EQUALS 1747 HOURS)

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz

FISCAL YEAR: FY01 - FY05

Resource: BUYCON  
Res Dept: 943

BUYER/CONTRACTS ADMIN  
Overtime: Class: EOC: SAL

LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	417.5	132.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	417.5	549.7	549.7	549.7	549.7	549.7	549.7	549.7	549.7
Yr Total Cost:	0	18,413	6,176	0	0	0	0	0	0	0
Cum Total Cost:	0	18,413	24,589	24,589	24,589	24,589	24,589	24,589	24,589	24,589

Resource: CHMOPR  
Res Dept: 943

CHEMICAL OPERATOR  
Overtime: Class: EOC: HOU

LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	83.5	26.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	83.5	109.9	109.9	109.9	109.9	109.9	109.9	109.9	109.9
Yr Total Cost:	0	2,742	920	0	0	0	0	0	0	0
Cum Total Cost:	0	2,742	3,662	3,662	3,662	3,662	3,662	3,662	3,662	3,662

Resource: CNSENG  
Res Dept: 943

CONSTRUCTION ENG  
Overtime: Class: EOC: SAL

LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	1,085.5	343.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	1,085.5	1,429.3	1,429.3	1,429.3	1,429.3	1,429.3	1,429.3	1,429.3	1,429.3
Yr Total Cost:	0	62,270	20,867	0	0	0	0	0	0	0
Cum Total Cost:	0	62,270	83,158	83,158	83,158	83,158	83,158	83,158	83,158	83,158

Resource: DRFCAD  
Res Dept: 943

DRAFTER/CAD OPERATOR  
Overtime: Class: EOC: SAL

LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	83.5	26.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	83.5	109.9	109.9	109.9	109.9	109.9	109.9	109.9	109.9
Yr Total Cost:	0	2,741	920	0	0	0	0	0	0	0
Cum Total Cost:	0	2,741	3,661	3,661	3,661	3,661	3,661	3,661	3,661	3,661

Resource: ENGCVL  
Res Dept: 943

ENGINEER CIVIL  
Overtime: Class: EOC: SAL

LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	417.5	132.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	417.5	549.7	549.7	549.7	549.7	549.7	549.7	549.7	549.7
Yr Total Cost:	0	23,897	8,016	0	0	0	0	0	0	0
Cum Total Cost:	0	23,897	31,913	31,913	31,913	31,913	31,913	31,913	31,913	31,913

## 7

DATE: SEP 6 2004

**ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)**

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman

**CAM:** Robert Fellman

(1 FTE EQUALS 1747 HOURS)

FISCAL YEAR: EV01 - EV05

31 Q13

<b>ENGINEER</b>	<b>EOC:</b>	<b>LABOR</b>
<b>Overtime:</b>	<b>Class:</b>	<b>SAL</b>

Oct 00-

Sen 03

3 199 3  
100.0

0

ENGINEER MECH/PIPING	EOC:	LABOR
Overtime:	Class:	SAL

Oct 00-

Sen 03

070 E  
C.117

0

ENG PROCESS/STARTUP	EOC:	LABOR
Overtime:	Class:	SAL

Oct 00-

Sep 03

279 8  
10.0

0.

ENVIR PROTECTION REP	EOC:	LABOR
Overtime:	Class:	SAL

Oct 00-

Sen 03

109.9  
20.4

5

FIRE PROTECTION ENG	EOC:	LABOR
Overtime:	Class:	SAL

Oct 00-

Sen 03

**W**

# Fluor Fernald, Inc.

PBS: 7

WBS: 1.1.H.B SILO 3

CTRL ACCT: HS3A SILO 3

CHARGE NO: HS3AP FINAL DESIGN-FFI

COMMENTS: F07-025

DATE: SEP 5, 2001

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman

PREPARED BY: Karen Wintz

FISCAL YEAR: FY01 - FY05

## ESTIMATE SUPPORT WORKSHEET FOR ACTIVITY BASED ESTIMATING (1 FTE EQUALS 1747 HOURS)

Yr Hours:	0.0	83.5	26.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	83.5	109.9	109.9	109.9	109.9	109.9	109.9	109.9	109.9	109.9	109.9
Yr Total Cost:	0	3,813	1,279	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	3,813	5,092	5,092	5,092	5,092	5,092	5,092	5,092	5,092	5,092	5,092

Resource: INDHYG  
Res Dept: 943  
Overtime:

LABOR

EOC: SAL

Class:

Yr Hours:	0.0	167.0	52.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	167.0	219.9	219.9	219.9	219.9	219.9	219.9	219.9	219.9	219.9	219.9
Yr Total Cost:	0	8,160	2,737	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	8,160	10,897	10,897	10,897	10,897	10,897	10,897	10,897	10,897	10,897	10,897

Resource: ODCTRVL  
Res Dept: 943  
Overtime:

ODC

EOC: ODC

Class:

Yr Units:	0.0	21,207.0	6,772.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	21,207.0	27,979.0	27,979.0	27,979.0	27,979.0	27,979.0	27,979.0	27,979.0	27,979.0	27,979.0	27,979.0
Yr Total Cost:	0	21,780	7,143	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	21,780	28,922	28,922	28,922	28,922	28,922	28,922	28,922	28,922	28,922	28,922

Resource: OPRMGR  
Res Dept: 943  
Overtime:

LABOR

EOC: SAL

Class:

Yr Hours:	0.0	751.5	238.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	751.5	989.5	989.5	989.5	989.5	989.5	989.5	989.5	989.5	989.5	989.5
Yr Total Cost:	0	41,354	13,871	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	41,354	55,226	55,226	55,226	55,226	55,226	55,226	55,226	55,226	55,226	55,226

Resource: PJSREP  
Res Dept: 943  
Overtime:

LABOR

EOC: SAL

Class:

Yr Hours:	0.0	918.5	290.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	918.5	1,209.4	1,209.4	1,209.4	1,209.4	1,209.4	1,209.4	1,209.4	1,209.4	1,209.4	1,209.4
Yr Total Cost:	0	39,416	13,221	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	39,416	52,638	52,638	52,638	52,638	52,638	52,638	52,638	52,638	52,638	52,638

Resource: PURMGR  
Res Dept: 943  
Overtime:

LABOR

EOC: SAL

Class:

# Fluor Fernald, Inc.

PBS: 7

WBS: 1.1.H.B SILO 3  
CTRL ACCT: HS3A SILO 3  
CHARGE NO: HS3AP FINAL DESIGN-FFI

COMMENTS: F07-025

DATE: SEP 5, 2001

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman

PREPARED BY: Karen Winiz

FISCAL YEAR: FY01 - FY05

## ESTIMATE SUPPORT WORKSHEET FOR ACTIVITY BASED ESTIMATING (1 FTE EQUALS 1747 HOURS)

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	835.0	264.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	835.0	1,099.4	1,099.4	1,099.4	1,099.4	1,099.4	1,099.4	1,099.4	1,099.4
Yr Total Cost:	0	55,635	18,661	0	0	0	0	0	0	0
Cum Total Cost:	0	55,635	74,296	74,296	74,296	74,296	74,296	74,296	74,296	74,296

Resource:	QACENG	QA ENGINEER	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	
Yr Hours:	0.0	0.0	0.0	0.0
Cum Hours:	0.0	417.5	132.2	0.0
Yr Total Cost:	0	417.5	549.7	549.7
Cum Total Cost:	0	20,197	26,972	26,972

Resource:	QACMGR	QA MANAGER	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	
Yr Hours:	0.0	0.0	0.0	0.0
Cum Hours:	0.0	83.5	109.9	109.9
Yr Total Cost:	0	4,730	1,587	0
Cum Total Cost:	0	4,730	6,317	6,317

Resource:	RADENG	RAD ENGINEER	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	
Yr Hours:	0.0	0.0	0.0	0.0
Cum Hours:	0.0	417.5	132.2	0.0
Yr Total Cost:	0	20,742	6,958	0
Cum Total Cost:	0	20,742	27,700	27,700

Resource:	SERVSUB	SUBS	EOC:	SUBCONTRACTORS
Res Dept:	943	Overtime:	SUB	
Yr Units:	0.0	0.0	0.0	0.0
Cum Units:	0.0	44,364.1	14,166.7	0.0
Yr Total Cost:	0	44,364.1	58,530.8	58,530.8
Cum Total Cost:	0	45,562	14,942	60,504

~~Fluor Fernald, Inc.~~

PBS: 7

WBS:	1.1.H.B	SILO 3
CTRL ACCT:	HS3A	SILO 3
CHARGE NO:	HS3AP	FINAL D

COMMENTS: F07-025

Resource: TPSREP  
Res Dept: 943

**TECH/PROG SUPT REP**  
**Overtime:**

Class: \_\_\_\_\_ EOC: \_\_\_\_\_ LABOR \_\_\_\_\_

**ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)**

DATE: SEP 5 2001

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman

PREPARED BY: Karen Wintz

FISCAL YEAR: FY01 - FY05

Yr Hours: .  
Cum Hours:

Yr Total Cost:  
Cum Total Cost:

Cum Total Cost:

Resource: WSTENG  
Res Dept: 943

**WASTE ENGINEER**  
**Overtime:**

Class: EOC: LABOR

Yr Hours:  
Cum Hours:

Cum Hours:

Yr Total Cost:

Cum Total Cost:

Resource: WSTMGR  
Res Dept: 943

**WASTE ENGINEER MGR**  
**Overtime:**

Class: EOC: LABOR

Yr Hours:  
Cum Hours:

Yr Total Cost:  
Cum Total Cost:

**Cum Total Cost:**

**GRAND TOTAL:**

**GRAND TOTALS:**

Yr Hours:  
Cum Hours:

Yr Total Cost:

**Cum Total Cost:**

Robert Fullman

CAM

CONTROL TEAM



**HS3AR**

**FINAL DESIGN - JACOBS**





Fluor Fernald, Inc.

7

PBS: 1.1.HB SILO 3  
CTRL ACCT: HS3A SILO 3  
CHARGE NO: HS3AR FINAL DESIGN-JACOBS  
COMMENTS: F07-025 F07-060

DATE: SEP 5, 2001  
PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

Resource:	SERV/SUB	SUBS	JEG	Class:	EOC:	SUBCONTRACTORS											
Res Dept:	943	Overtime:			SUB												
Yr Units:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10							
Cum Units:	0.0	1,211,941.5	387,006.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
Yr Total Cost:	0.0	1,211,941.5	1,598,948.0	1,598,948.0	1,598,948.0	1,598,948.0	1,598,948.0	1,598,948.0	1,598,948.0	1,598,948.0							
Cum Total Cost:	0	1,244,664	408,187	0	0	0	0	0	0	0							
	0	1,244,664	1,652,851	1,652,851	1,652,851	1,652,851	1,652,851	1,652,851	1,652,851	1,652,851							
GRAND TOTALS:																	
Yr Total Cost:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10							
Cum Total Cost:	0	1,244,664	408,187	0	0	0	0	0	0	0							
	0	1,244,664	1,652,851	1,652,851	1,652,851	1,652,851	1,652,851	1,652,851	1,652,851	1,652,851							

CAM Robert Fellman

CONTROL TEAM *Karen Wintz*



**HS3AS**

**TITLE III SUPPORT – FLUOR FERNALD**



# Fluor Fernald, Inc.

PBS: 7

DATE: SEP 5, 2001

WBS: 1.1.H.B SILO 3

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

CTRL ACCT: HS3A SILO 3

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz

CHARGE NO: HS3AS TITLE III SUPPORT-FFI

FISCAL YEAR: FY01 - FY05

COMMENTS: F07.025

Resource: ENGCVL ENGINEER CIVIL EOC: LABOR  
Res Dept: 943 Overtime: SAL Class:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	847.6	369.5	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	847.6	1,217.1	1,217.1	1,217.1	1,217.1	1,217.1	1,217.1	1,217.1
Yr Total Cost:	0	0	51,387	23,723	0	0	0	0	0	0
Cum Total Cost:	0	0	51,387	75,109	75,109	75,109	75,109	75,109	75,109	75,109

Resource: ENGINR ENGINEER EOC: LABOR  
Res Dept: 943 Overtime: SAL Class:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	3,729.3	1,625.8	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	3,729.3	5,355.1	5,355.1	5,355.1	5,355.1	5,355.1	5,355.1	5,355.1
Yr Total Cost:	0	0	285,890	131,982	0	0	0	0	0	0
Cum Total Cost:	0	0	285,890	417,872	417,872	417,872	417,872	417,872	417,872	417,872

Resource: ODCTRVL TRAVEL RESOURCE EOC: ODC  
Res Dept: 943 Overtime: OAKR Class:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Units:	0.0	0.0	13,988.4	6,011.6	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	0.0	13,988.4	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0
Yr Total Cost:	0	0	14,754	6,518	0	0	0	0	0	0
Cum Total Cost:	0	0	14,754	21,272	21,272	21,272	21,272	21,272	21,272	21,272

Resource: TPSREP TECH/PROG SUPT REP EOC: LABOR  
Res Dept: 943 Overtime: SAL Class:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	2,034.2	886.8	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	2,034.2	2,921.0	2,921.0	2,921.0	2,921.0	2,921.0	2,921.0	2,921.0
Yr Total Cost:	0	0	117,840	54,401	0	0	0	0	0	0
Cum Total Cost:	0	0	117,840	172,241	172,241	172,241	172,241	172,241	172,241	172,241

## GRAND TOTALS:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	6,611.1	2,882.1	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	6,611.1	9,493.2	9,493.2	9,493.2	9,493.2	9,493.2	9,493.2	9,493.2
Yr Total Cost:	0	0	469,870	216,624	0	0	0	0	0	0
Cum Total Cost:	0	0	469,870	686,495	686,495	686,495	686,495	686,495	686,495	686,495

Fluor Fernald, Inc.

7

PBS:

WBS: 1.1.HB SILO 3

CTRL ACCT: HS3A SILO 3

CHARGE NO: HS3AS TITLE III SUPPORT-FFI

COMMENTS: F07-025

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

DATE: SEP 5, 2001

PROJECT MGR: Robert Fellman

CAM: Robert Fellman

PREPARED BY: Karen Wintz

FISCAL YEAR: FY01 - FY05

CAM

*Robert Fellman*

CONTROL TEAM

*Karen Wintz*

**HS3AT**

**TITLE III SUPPORT - JACOBS**





## Fluor Fernald, Inc.

PBS: 7

WBS: 1.1.H.B SILO 3  
CTRL ACCT: HS3A SILO 3CHARGE NO: HS3AT TITLE III SUPPORT-JACOBS  
COMMENTS: F07-025 F07-060

DATE: SEP 5, 2001

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman

PREPARED BY: Karen Wintz

FISCAL YEAR: FY01 - FY05

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)Resource: RESVSUB SUBS EOC: SUBCONTRACTORS  
Res Dept: 943 Overtime: JEG Class: SUB

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Units:	0.0	0.0	855,499.4	367,652.6	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	0.0	855,499.4	1,223,152.0	1,223,152.0	1,223,152.0	1,223,152.0	1,223,152.0	1,223,152.0	1,223,152.0
Yr Total Cost:	0	0	902,320	398,632	0	0	0	0	0	0
Cum Total Cost:	0	0	902,320	1,300,952	1,300,952	1,300,952	1,300,952	1,300,952	1,300,952	1,300,952

## GRAND TOTALS:

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Total Cost:	0	0	902,320	398,632	0	0	0	0	0	0
Cum Total Cost:	0	0	902,320	1,300,952	1,300,952	1,300,952	1,300,952	1,300,952	1,300,952	1,300,952

CAM

Robert Fellman

CONTROL TEAM



**HS3AC**

**CONSTRUCTION MANAGEMENT**



# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

7

DATE: 5-Sep-01

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz

FISCAL YEAR: FY01 - FY05

Resource: BUYCON  
Res Dept: 943

BUYER/CONTRACTS ADMIN  
Overtime:

Class: EOC:  
SAL

LABOR

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	168.4	1,134.9	669.4	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	168.4	1,303.2	1,972.6	1,972.6	1,972.6	1,972.6	1,972.6	1,972.6	1,972.6
Yr Total Cost:	0	7,425	53,015	33,113	0	0	0	0	0	0
Cum Total Cost:	0	7,425	60,440	93,553	93,553	93,553	93,553	93,553	93,553	93,553

Resource: CNSCOD  
Res Dept: 943

CONSTRUCTION COORD  
Overtime:

Class: EOC:  
SAL

LABOR

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	1,575.8	356.2	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	1,575.8	1,932.0	1,932.0	1,932.0	1,932.0	1,932.0	1,932.0	1,932.0
Yr Total Cost:	0	0	55,762	13,349	0	0	0	0	0	0
Cum Total Cost:	0	0	55,762	69,110	69,110	69,110	69,110	69,110	69,110	69,110

Resource: CENSENG  
Res Dept: 943

CONSTRUCTION ENG  
Overtime:

Class: EOC:  
SAL

LABOR

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	1,010.1	8,385.1	4,345.4	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	1,010.1	9,395.3	13,740.7	13,740.7	13,740.7	13,740.7	13,740.7	13,740.7	13,740.7
Yr Total Cost:	0	57,947	509,493	279,603	0	0	0	0	0	0
Cum Total Cost:	0	57,947	567,441	847,044	847,044	847,044	847,044	847,044	847,044	847,044

Resource: CNSMGR  
Res Dept: 943

CONSTRUCTION MGR  
Overtime:

Class: EOC:  
SAL

LABOR

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	315.6	71.3	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	315.6	386.9	386.9	386.9	386.9	386.9	386.9	386.9
Yr Total Cost:	0	0	21,819	5,223	0	0	0	0	0	0
Cum Total Cost:	0	0	21,819	27,042	27,042	27,042	27,042	27,042	27,042	27,042

Resource: DEPADM  
Res Dept: 943

DEPT ADMINISTRATOR  
Overtime:

Class: EOC:  
SAL

LABOR

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	315.2	71.2	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	315.2	386.4	386.4	386.4	386.4	386.4	386.4	386.4

7  
PBS:

DATE: 5-Sep-01  
PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

[illegible][illegible]

Resource: Res Dept:	INDHYG 943	INDUSTRIAL HYGIENIST Overtime:	Class:	EOC: SAL	LABOR						
		Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-

## 7

DATE: 5-Sep-01  
PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

[illegible][illegible]

Resource:	QACENG	EOC:	LABOR
Res Dept:	943	Class:	SAL
		Overline:	

# Fluor Fernald, Inc.

PBS: 7

DATE: 5-Sep-01

WBS: 1.1.H.B SILO 3

PROJECT MGR: Robert Fellman

CTRL ACCT: HS3A SILO 3

CAM: Robert Fellman

CHARGE NO: HS3AC CONSTRUCTION MANAGEMENT

PREPARED BY: Karen Wintz

COMMENTS: F07-025, F07-028

FISCAL YEAR: FY01 - FY05

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

Yr Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:	0.0	168.4	2,395.5	463.1	0.0	3,027.0	3,027.0	0.0	0.0	0.0
Yr Total Cost:	0	168.4	2,563.9	3,027.0	3,027.0	3,027.0	3,027.0	3,027.0	3,027.0	3,027.0
Cum Total Cost:	0	8,145	122,747	25,128	0	156,020	156,020	156,020	156,020	156,020

Resource:	QA/QC TECH	Class:	EOC:	LABOR
Res Dept:	943		SAL	
Yr Hours:	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	1,575.8	356.2
Yr Total Cost:	0	0	54,251	12,987
Cum Total Cost:	0	0	54,251	67,238

Resource:	RAD ENGINEER	Class:	EOC:	LABOR
Res Dept:	943		SAL	
Yr Hours:	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	1,575.8	356.2
Yr Total Cost:	0	0	54,251	12,987
Cum Total Cost:	0	0	54,251	67,238

Resource:	RAD TECH	Class:	EOC:	LABOR
Res Dept:	943		SAL	
Yr Hours:	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	1,575.8	356.2
Yr Total Cost:	0	0	54,251	12,987
Cum Total Cost:	0	0	54,251	67,238

Resource:	S&H ENG	Class:	EOC:	LABOR
Res Dept:	943		SAL	
Yr Hours:	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	1,575.8	356.2
Yr Total Cost:	0	0	54,251	12,987
Cum Total Cost:	0	0	54,251	67,238



**Fluor Fernald, Inc.**

PBS: 7

1.1.H.B. SILO 3

CTRL ACCT: HS3A

HS3A SILO

CHARGE NO: HS3AC CONSTRUCTION MANAGEMENT

COMMENTS: F07-025, F07-028

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

DATE:

5-Sep-01

PROJECT MCD: Robert Callones

CAM.

CAM: Robert Fellman

PREPARED BY: Karen Winiz

FISCAL YEAR: FY01 - FY05

Yr	0	8,809	89,097	16,725	0	0	0	0
Total Cost:	0	8,809	89,097	16,725	0	0	0	0
Cum	0	8,809	97,906	114,631	114,631	114,631	114,631	114,631
Total Cost:	0	8,809	97,906	114,631	114,631	114,631	114,631	114,631

Resource: TPSREP  
Res Dept: 943

TECH/PROG SUPT REP  
Overtime:

EOC: SAL  
Class:

LABOR

Resource:	TPSREP	TECH/PROG SUPT REP
Res Dept:	943	Overtime:

Resource:	TPSREP	TECH/PROG SUPT REP	EOC:
Res Dept:	943	Overtime:	SAL

Resource: TPSREP  
Res Dept: 943

TECH/PROG SUPT REP  
Overtime:

EOC: SAL  
Class:

LABOR

[illegible]

Resource: WSTENG  
Res Dept: 943

WASTE ENGINEER  
Overtime:

EOC:  
SAL

LABOR

Resource: WSTENG  
Res Dept: 943  
WASTE ENGINEER  
Overtime:

Resource: WSTENG  
Res Dept: 943  
Class: Overline: WASTE ENGINEER  
EOC: SAL

Resource: WSTENG  
Res Dept: 943

WASTE ENGINEER  
Overtime:

EOC:  
SAL

LABOR

[illegible]

**GRAND TOTALS:**

[illegible]

CAM

Robert Fellman

CONTROL TEAM

Harold J. Pictet



**HS3AD**

**SUBCONTRACTS**



# Fluor Fernald, Inc.

PBS: 7

WBS: 1.1.H.B SILO 3

CTRL ACCT: HS3A SILO 3

CHARGE NO: HS3AD SUBCONTRACTS

COMMENTS: F07-025, F07-028

DATE: SEP 5, 2001

PROJECT MGR: Robert Fellman

CAM: Robert Fellman

PREPARED BY: Karen Wintz

FISCAL YEAR: FY01 - FY05

## ESTIMATE SUPPORT WORKSHEET FOR ACTIVITY BASED ESTIMATING (1 FTE EQUALS 1747 HOURS)

Resource: FIELD SUBS FIELD SUBS SUBCONTRACTORS

Res Dept: 943 Overtime:

Class: EOC: SUB

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Units:	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Cum Units:	0.0	0.0	6,953,599.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0.0	0.0	6,953,599.0	6,953,599.0	6,953,599.0	6,953,599.0	6,953,599.0	6,953,599.0	6,953,599.0	6,953,599.0
Cum Total Cost:	0	0	7,334,163	7,334,163	7,334,163	7,334,163	7,334,163	7,334,163	7,334,163	7,334,163

GRAND TOTALS:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Total Cost:	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Cum Total Cost:	0	0	7,334,163	7,334,163	7,334,163	7,334,163	7,334,163	7,334,163	7,334,163	7,334,163

CAM

Robert Fellman

REVIEW TEAM

CONTROL TEAM





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**Memorandum**

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To: Karen Wintz

Date: May 15, 2001

Location: Fernald

Reference: N/A

From: Ken Kepler, MS80-3

Fernald #: M:OOTP(PC/EST):2001-0067

Location: Springdale

Client: DOE DE-AC24-01OH20115

Extension: 648-6767

Subject: SILO 3 BASELINE

c: File Record Subject ESTIMATE C4-2001-03-001  
Roger Johnson, MS51  
Doris Edwards, MS20

Attached are two (2) copies for the SILO 3 BASELINE.

To request any additional copies of this estimate or for any questions, please contact Roger Johnson on extension 4140.

KGK:RLJ:hmp  
Attachment





## ESTIMATE REVIEW FORM

PROJECT: Silo 3 Baseline  
ESTIMATE NO.: C4-2001-03-001  
CLIENT: DOE  
WBS NO.: 1.1.H.B

**FLUOR** FERNALD

DATE: 15-May-01  
ESTIMATOR: Johnson  
LOCATION: Fernald  
TASK NO.: HS3AD

COMPLETE ESTIMATE PACKAGE YES \_\_\_\_\_ NO \_\_\_\_\_

REQUIRED DOCUMENTS Equipment list, Site Drawings, Equipment Arrangement Drawings,  
Section View, Lighting Plan and a PFD.

COMMENTS: Estimate was based on the above documents

REVIEWERS SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

RESOLUTION: \_\_\_\_\_

ESTIMATOR: \_\_\_\_\_ DATE \_\_\_\_\_

REVIEWER: \_\_\_\_\_ DATE \_\_\_\_\_

# ESTIMATE REVIEW FORM

PROJECT: Silo 3 Baseline  
ESTIMATE NO.: C4-2001-03-001  
CLIENT: DOE  
WBS NO.: 1.1.H.B

**FLUOR FERNALD**

DATE: 15-May-01  
ESTIMATOR: Johnson  
LOCATION: Fernald  
TASK NO.: HS3AD

OTHER REVIEWS: See back-up folder for the reviews and comments of the project personnel.

REQUESTER \_\_\_\_\_

DATE \_\_\_\_\_

CAM if > \$100,000 \_\_\_\_\_

DATE \_\_\_\_\_

PROJ.MGR. if > \$ 1M \_\_\_\_\_

DATE \_\_\_\_\_

ESTIMATING SERVICES  
TEAM COACH



DATE 5/15/01

**FLUOR FERNALD  
PROJECTS CONTROLS  
ESTIMATING SERVICES**

May 15, 2001

**PROJECT DESCRIPTION: Silo 3 Project**

**WBS:1.1.H.B**

**PROJECT ENGINEER: Karen Wintz**

**ESTIMATOR: R Johnson**

**ESTIMATE NUMBER: C4-01-03-01**

**BASIS OF ESTIMATE**

**SUPPORTING DOCUMENTATION:**

Verbal Scope	<input type="checkbox"/>	P & ID's	<input type="checkbox"/>	Work Plan	<input type="checkbox"/>
Drawings	<input checked="" type="checkbox"/>	Equipment List	<input checked="" type="checkbox"/>	Site Walk	<input type="checkbox"/>
Sketches	<input type="checkbox"/>	Specifications	<input type="checkbox"/>	Eng. Mtg.	<input type="checkbox"/>
Flow Diagrams	<input type="checkbox"/>	Written Scope	<input checked="" type="checkbox"/>	Prev. Estimates	<input type="checkbox"/>

**TYPE OF ESTIMATE:**

Change Order	<input type="checkbox"/>	Government	<input type="checkbox"/>
Plan/Feasibility	<input type="checkbox"/>	Conceptual	<input checked="" type="checkbox"/>
Construction	<input type="checkbox"/>	Title I Design	<input type="checkbox"/>
Budget	<input type="checkbox"/>	Independent	<input type="checkbox"/>

**BASIS OF ESTIMATE:**

The purpose of estimate C4.01.03.01 is to provide a cost for the construction of Containment and Treatment Shelters for the removal of the material from silo #3. These structures will be a metal frame with a fabric inner and outer covering. Included in the building is the cost to purchase and install all exterior doors. All utilities(water, communication and electrical power) will be brought to this facility from nearby tie-in points. Trailers will be used to house the control room and the change rooms. Unit heaters will be used to heat the two-shelters. The HVAC duct, dampers and HEPA filters are all external to the two shelters. The HVAC stack as well as the Treatment shelter will be erected on existing concrete slabs. Additional concrete pours will be for the Containment shelter floor and for the HVAC HEPA filter housings. The provided sketches show the locations for the equipment placement and the equipment list was used to price and install this equipment. A steel structure is estimated for the platforms that will be next to the stack. A construction subcontractor will cut concrete opening in the silo walls. Mobilization and

**FLUOR FERNALD  
PROJECTS CONTROLS  
ESTIMATING SERVICES**

May 15, 2001

**PROJECT DESCRIPTION: Silo 3 Project**

**WBS:1.1.H.B**

**PROJECT ENGINEER: Karen Wintz**

**ESTIMATOR: R Johnson**

**ESTIMATE NUMBER: C4-01-03-01**

demobilization costs assumes that are three (3) subcontractors that will do the construction.

**ESTIMATE ASSUMPTIONS**

**EXECUTION:**

- ☐ This project is to be performed on a 50-hour week, 10 hours a day (per contract agreement).
- ☒ This project is to be performed on a 40-hour week, 10 hours a day.
- ☐ Premium time allowed in addition to contractual 50-hour weeks.

**WAGE RATES:**

- ☒ Wage rates within this estimate are based on Project Labor Agreement rates, effective October 1999 and are considered FY01 dollars for estimating.
- ☐ Wage rates within this estimate are based on FDF Support Contractor FSC 599 wage rates, effective October 1999 and are considered FY01 dollars for estimating.
- ☐ Wage rates and fringes within this estimate are per actual contract agreement. Wage rates for this contractor have been adjusted to include overtime costs resulting from the scheduled 50-hour week.

**ENGINEERING:**

- ☒ N/A
- ☐ Engineering dollars provided by the Project Engineer.
  - ☐ Engineering dollars have been factored in at the standard 12% of the total direct and indirect field costs as per request of Project Engineer.

**CONSTRUCTION MANAGEMENT:**

- ☒ N/A
- ☐ Construction Management dollars provided by the Project Engineer.
- ☐ Construction Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

**PROJECT MANAGEMENT:**

- ☒ N/A
- ☐ Project Management dollars provided by the Project Engineer.
- ☐ Project Management dollars have been factored in at the standard 30% of the total direct and indirect field costs as per request of Project Engineer.

**FLUOR FERNALD  
PROJECTS CONTROLS  
ESTIMATING SERVICES**

May 15, 2001

**PROJECT DESCRIPTION: Silo 3 Project**

**WBS:1.1.H.B**

**PROJECT ENGINEER: Karen Wintz**

**ESTIMATOR: R Johnson**

**ESTIMATE NUMBER: C4-01-03-01**

**WASTE PROGRAM MANAGEMENT:**

- ☒ Waste Program costs, for all material disposal, are now part of their budget and are not part of this estimate
- ☐ Waste Program Management dollars provided by the Project Engineer.

**PRODUCTIVITY:**

See appendix "B" for productivity factors

**ESCALATION:**

Escalation costs are excluded from the target estimate. The escalation costs are calculated within the Micro-Frame computer system according to the plan for rebaselining.

**UNIT RATES:**

Labor rates are the crew rates based on the current site labor rates.

**A (HO EXPENSE**

expense is now a part of the over all project expense and is excluded from this estimate. Each project has to budget its own manpower.

**HEALTH PHYSICS:**

attached APPENDIX "C".

**RISK BUDGET:**

Risk budget will now be based on a project level and will be done after the rebaselining is complete. No risk analysis will be done for this estimate.

**CONTINGENCY:**

N/A.

**G &**

**This**

**See**

**FLUOR FERNALD  
PROJECTS CONTROLS  
ESTIMATING SERVICES**

May 15, 2001

**PROJECT DESCRIPTION: Silo 3 Project**

**WBS:1.1.H.B**

**PROJECT ENGINEER: Karen Wintz**

**ESTIMATOR: R Johnson**

**ESTIMATE NUMBER: C4-01-03-01**

**ESTIMATE INCLUSIONS & EXCLUSIONS**

**INCLUSIONS:**

- The supplied drawings were the primary source for the material take-off.
- The Treatment and Containment building costs were supplied by the Project.
- Material pricing was from Mean's
- Unit man-hours were from Mean's or previous estimates.
- The equipment list was provided by the project.
- Cutting, of the opening in the silo wall, will be by a water laser..
- Removal of the concrete blocks from the silo wall.
- All HVAC ducting to the HEPA filters and stack will be external to the buildings.
- Concrete slabs for the Treatment building and HVAC stack are existing.
- Two Sealand storage containers will be purchased for warehousing.
- Freight for equipment is at 2.5 % of equipment costs.
- Utilities to this facility will be from near by sources.
- The project supplied the phone quote, from a subcontractor, to cut the opening in the silo wall.

**FLUOR FERNALD  
PROJECTS CONTROLS  
ESTIMATING SERVICES**

May 15, 2001

**PROJECT DESCRIPTION: Silo 3 Project**

**WBS:1.1.H.B**

**PROJECT ENGINEER: Karen Wintz**

**ESTIMATOR: R Johnson**

**ESTIMATE NUMBER: C4-01-03-01**

**EXCLUSIONS:**

- Permits and fees.
- FD G & A (Home Office Expense)
- Construction Management Costs
- Waste disposal costs including shipping and burial fees.
- Project Management Costs.
- A/E Costs
- Any costs associated with schedule extension, including construction equipment, staff costs, facility costs and other indirect costs.
- D & D costs for the new construction
- Start-up costs.
- Any costs to decontaminate any portion of the silo or new construction prior to the operation phase.
- Any testing costs other than normal construction testing.
- Any and all fire suppression costs





## ESTIMATE SUMMARY SHEET

PROJECT: Silo 3 Baseline  
 ESTIMATE #: C4-2001-03-001  
 CLIENT: DOE  
 WBS #: 1.1.H.B

# FLUOR FERNALD

DATE: 15-May-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HS3AD

ITEM DESCRIPTION	M/H	RATE	LABOR \$	S/C \$	MAT'L \$	EQUIP. \$	TOTAL \$
Mobilization/Demobilization	1,510		\$41,500				\$41,500
Site Work	3,876		\$88,700	\$150,000	\$5,400		\$244,100
Concrete	1,142		\$28,500		\$14,400		\$42,900
Structural	664		\$17,600		\$34,500		\$52,100
Buildings	8,209		\$209,500		\$487,800		\$697,300
Equipment	5,184		\$130,900			\$2,170,100	\$2,301,000
Piping	1,344		\$39,600		\$28,300		\$67,900
Electrical	6,928		\$170,500		\$124,500	\$89,200	\$384,200
Instrumentation	1,674		\$42,400		\$261,000	\$615,000	\$918,400
Painting	719		\$18,900		\$6,500		\$25,400
Insulation	225		\$5,400		\$6,000		\$11,400
<b>DIRECT FIELD COSTS TOTAL</b>	<b>31,475</b>	<b>\$25.21</b>	<b>\$793,500</b>	<b>\$150,000</b>	<b>\$968,400</b>	<b>\$2,874,300</b>	<b>\$4,786,200</b>
SUPERVISION - CONTRACTOR	6,925		\$174,600				\$174,600
SMALL TOOLS & CONSUMABLES	-	-	-		\$63,500		\$63,500
MISC. EQUIP. RENTAL	-	-	-			\$188,900	\$188,900
TEMPORARY FACILITIES	1,259		\$31,700		\$31,700		
TEMPORARY UTILITY HOOK-UP	1,023		\$25,800		\$13,900		
JOB CLEAN-UP	1,889		\$47,600		\$15,900		
PER DIEM / SUBSISTANCE	-	-	-				
HEALTH PHYSICS S/C	488		\$12,300		\$3,800		
CERCLA - TRAINING	25		\$600				
GET/SITE ACCESS & JOB SPECIFIC TRAINING	738		\$18,600				
PAYROLL BURDENS & BENEFITS	-	-	\$629,700				\$629,700
OVERHEAD & PROFIT	-	-	-	\$1,168,600			\$1,168,600
BOND	-	-	-	\$91,100			\$91,100
SALES TAX	-	-	-		\$65,800	\$183,800	\$249,600
<b>INDIRECT FIELD COSTS TOTAL</b>	<b>12,346</b>		<b>\$940,900</b>	<b>\$1,259,700</b>	<b>\$194,600</b>	<b>\$372,700</b>	<b>\$2,767,900</b>
<b>DIRECT &amp; INDIRECT FIELD COSTS TOTAL</b>	<b>43,821</b>	<b>\$39.58</b>	<b>\$1,734,400</b>	<b>\$1,409,700</b>	<b>\$1,163,000</b>	<b>\$3,247,000</b>	<b>\$7,554,100</b>
<b>TARGET ESTIMATE (FY 01 DOLLARS)</b>							<b>\$7,554,100</b>

ESTIMATE PERFORMED BY ESTIMATING SERVICES

# ESTIMATE SUMMARY SHEET

PROJECT: Silo 3 Baseline  
ESTIMATE NO.: C4-2001-03-001  
CLIENT: DOE  
WBS NO.: 1.1.H.B

## FACTORS

DATE: 15-May-01  
ESTIMATOR: Johnson  
LOCATION: Fernald  
TASK NO.: HS3AD

FIXED PRICE \$	LABOR \$	S/C \$	MAT'L \$	EQUIP. \$	PPE \$	TOTAL \$
DFC DOLLARS	\$793,500	\$150,000	\$968,400	\$2,874,300	\$3,800	\$4,790,000
IFC COST FACTOR	2.1858		1.1291	1.0657	-	
BOND + OVERHEAD & PROFIT COST FACTOR	1.2001	1.2001	1.2001	1.2001	1.2001	
SALES TAX	-	-	1.0600	1.0600	1.0600	
DIRECT FIELD COST FACTOR =	2.6232	1.2001	1.4363	1.3557	1.2721	
BASE ESTIMATE \$'s	\$2,081,506	\$180,020	\$1,390,956	\$3,896,813	\$4,834	\$7,554,129
BASE FACTOR	1.0000	1.0000	1.0000	1.0000	1.0000	
TARGET ESTIMATE FACTOR	2.6232	1.2001	1.4363	1.3557	1.2721	
FPS TARGET ESTIMATE (FY01 \$)	\$2,081,506	\$180,020	\$1,390,956	\$3,896,813	\$4,834	\$7,554,129

### NOTE:

- 1.) The above costs represent constant FY dollars and require de-escalation to FY01 for input to microframe. SEE De-Escalated Summary....N/A
- 2.) If there are no DFC Equip. \$, enter The IFC Equip. \$'s into the direct field cost TOTAL and delete IFC Factor in G62.





# FLUOR FERNALD

DATE: 15-May-01  
ESTIMATOR: Johnson  
LOCATION: Fernald  
TASK NO.: HS3AD

[illegible]

**PROJECT:** Silo 3 Baseline  
**ESTIMATE NO.:** C4-2001-03-001  
**CLIENT:** DOE  
**WBS NO.:** 1.1.H.B

**DATE:** 15-May-01  
**ESTIMATOR:** Johnson  
**LOCATION:** Fernald  
**TASK NO.:** HS3AD

# FLUOR FERNALD

ITEM NO.	QTY	UNIT	MAN-HOURS			COST/UNIT				LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Total	Rate	Labor	S/C	Mat'l	Equip					
D	Mobilization													
	105	hr	1	105	21.49				\$2,260					\$0
	60	hr	1	60	24.75				\$1,490					\$2,260
	210	hr	1	210	22.69				\$4,760					\$1,490
	30	hr	1	30	22.69				\$680					\$4,760
	700	hr	1	700	33.00				\$23,100					\$680
														\$23,100
	Demobilization													\$0
	405		1.00	405	22.70				\$9,190		\$0			\$9,190
	Same as mobilization													
Subtotal Direct Cost				1510					\$41,480	\$0	\$0	\$0	\$0	\$41,480

# DETAIL ESTIMATE WORKSHEETS

PROJECT: Silo 3 Baseline  
ESTIMATE NO.: C4-2001-03-001  
CLIENT: DOE  
WBS NO.: 1.1.H.B

DATE: 15-May-01  
ESTIMATOR: Johnson  
LOCATION: Fernald  
TASK NO.: HS3AD

# FLUOR FERNALD

ITEM NO.	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Total	Rate	Labor	S/C	Mat'l					
D	365	cy	0.22	112	21.49				\$2,410				\$2,410
D	420	cy	0.15	88	21.49				\$1,890				\$1,890
D	420	cy	0.10	59	21.49				\$1,260				\$1,260
C	1	ea					\$150,000			\$150,000			\$150,000
D	12	ea	5.00	84	21.49				\$1,800				\$1,800
D	11	cy	0.75	12	21.49			\$12	\$250		\$140		\$390
C	1	lot	24.00	47	21.49				\$1,000				\$1,000
D	3	lot	12.00	50	21.49			\$450	\$1,080		\$1,440		\$2,520
C	3	lot	8.00	47	21.49				\$1,000				\$1,000
C	3	ea	24.00	140	21.49				\$3,010				\$3,010
C	3	ea	10.00	58	21.49			\$150	\$1,260		\$480		\$1,740
D	1	ea	50.00	70	21.49				\$1,500				\$1,500
mC	2	cy	1.50	6	21.49				\$120		\$0		\$120
mC	72	lf	0.21	28	21.49			2.97	\$590		\$230		\$820
mC	1	lot	75.00	139	21.49				\$3,000		\$0		\$3,000
D	1	lot	35.00	49	21.49				\$1,050				\$1,050
D	4	cy	3.00	17	21.49				\$360				\$360
D	1	lot	80.00	112	21.49				\$2,400				\$2,400
D	625	sy	0.07	61	21.49				\$1,310				\$1,310
D	555	sy	0.07	54	21.49				\$1,170				\$1,170
D	8	lot	12.00	17	21.49				\$360				\$360
mC	100	cy	0.11	16	21.49				\$350				\$350
mC	100	cy	0.11	20	21.49				\$440				\$440
D	1	ea	4.00	6	21.49				\$120				\$120
D	625	sy	0.05	47	21.49				\$1,010		\$1,380		\$2,390
D	555	sy	0.05	42	21.49				\$900		\$1,230		\$2,130
C	1	lot	250.00	487	21.49			500.00	\$10,470		\$530		\$11,000
D	130	cy	0.10	18	21.49				\$390				\$390
D	1	lot	90	90	21.49				\$1,930				\$1,930
D	1600	hrs	1.00	1600	21.49				\$34,380				\$34,380
D	1000	lf	0.05	70	21.49			0.62	\$1,500				\$1,500
D	1	lot	40.00	56	21.49				\$1,200				\$1,200
D	1	lot	125	175	21.49				\$5,400				\$5,400
D	1	lot							\$3,750				\$3,750
D				3876					\$88,660	\$150,000	\$5,430	\$0	\$244,090

Subtotal Direct Cost

# FLUOR FERNALD

DATE: 15-May-01  
ESTIMATOR: Johnson  
LOCATION: Fernald  
TASK NO.: HS3AD

ITEM NO.		QTY	UNIT	MAN-HOURS			COST/UNIT				LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	S/C	Mat'l	Equip					
D	Slab on Grade-Containment building	50	cy	4.20	293	22.43				\$6,580		\$4,770		\$11,350	
D	6" curb	4	cy	3.70	21	22.43			89.40	\$460		\$280		\$740	
D	Equipment Footings	15	cy	8.20	172	22.43			65.90	\$3,850		\$1,770		\$5,620	
D	HEPA Filter slab	25	cy	4.40	154	22.43			110.60	\$3,450		\$2,380		\$5,830	
D	Containment building walls	10	cy	12.20	170	22.43			89.40	\$3,820		\$1,970		\$5,790	
D	Sump walls	4	cy	12.20	68	22.43			184.30	\$1,530		\$790		\$2,320	
D	Sump embedded angle iron	54	lf	0.34	26	22.43			3.81	\$580		\$220		\$800	
D	Change-out/Airlock lock slab	9	cy	4.20	53	22.43			89.40	\$1,180		\$860		\$2,040	
D	Ductbank	17	cy	4.00	95	22.43			77.10	\$2,130		\$1,400		\$3,530	
D	CAT Testing	1	lot	90.00	90	22.43				\$2,020		\$0		\$2,020	
D	Overtime @ 25 % of construction labor									\$2,948					
	Subtotal Direct Cost	1	LOT		1,142	\$24.96				\$28,500	\$0	\$14,400	\$0	\$42,900	



# DETAIL ESTIMATE WORKSHEETS

# FLUOR FERNALD

PROJECT: Silo 3 Baseline  
ESTIMATE NO.: C4-2001-03-001  
CLIENT: DOE  
WBS NO.: 1.1.H.B

DATE: 15-May-01  
ESTIMATOR: Johnson  
LOCATION: Fernald  
TASK NO.: HS3AD

ITEM NO.	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Total	Rate	Labor	S/C	Mat'l					
D Tank Platform	3	ton	22.00	92	23.57			1580.00	\$2,170		\$5,060		\$7,230
D Stairs to Platform	15	rsr	2.31	48	23.57			91.60	\$1,140		\$1,470		\$2,610
D Stack Structure	9	ton	22.00	277	23.57			1403.00	\$6,520		\$13,470		\$19,990
D Stack Platform	2	ton	25.00	70	23.57			1580.00	\$1,650		\$3,370		\$5,020
D Wire rope for guy wires	660	lf	0.04	37	23.57			1.80	\$870		\$1,270		\$2,140
D Grating	148	sf	0.14	29	23.57			8.40	\$680		\$1,330		\$2,010
D Handrail	102	lf	0.20	28	23.57			14.55	\$670		\$1,580		\$2,250
D Ladder	74	vlf	1	66	23.57			67.50	\$1,560		\$5,330		\$6,890
D Davits	2	ea	6.00	17	23.57			750.00	\$400		\$1,600		\$2,000
Overtime @ 25 % of construction costs									\$1,958				\$1,958
Subtotal Direct Cost									\$17,600	\$0	\$34,500	\$0	\$52,100

# DETAIL ESTIMATE WORKSHEETS

PROJECT: Silo 3 Baseline  
ESTIMATE NO.: C4-2001-03-001  
CLIENT: DOE  
WBS NO.: 1.1.H.B

DATE: 15-May-01  
ESTIMATOR: Johnson  
LOCATION: Fernald  
TASK NO.: HS3AD

# FLUOR FERNALD

ITEM NO.	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Total	Rate	Labor	S/C	Mat'l					
D Treatment Building	8000	ea	0.37	4174	22.69			25.42	\$94,720		\$203,360		\$298,080
D Containment Building	1400	ea	0.45	888	22.69			30.91	\$20,150		\$43,274		\$63,424
D Control Trailer	1	ea	40.00	56	22.69			45000	\$1,270		\$45,000		\$46,270
D Change out Trailer	1	ea	50.00	70	22.69			35000	\$1,580		\$35,000		\$36,580
D Interior wall -Treatment building	9600	sf	0.06	805	22.69			1.08	\$18,260		\$10,368		\$28,628
D Retaining wall-Containment building	200	sf	0.09	25	22.69			1.65	\$570		\$330		\$900
D HVAC ductwork	5600	lbs	0.09	681	22.69			2.53	\$15,440		\$14,168		\$29,608
D HVAC Stack Header	90	lf	1.60	201	22.69			47.98	\$4,560		\$4,318		\$8,878
D Staires to trailers	8	ea	15	168	22.69			150.00	\$3,800		\$1,200		\$5,000
D Trailer Skirting	6400	sf	0.02	179	22.69			1.20	\$4,060		\$7,680		\$11,740
D Ducting supports	12	ea	6.20	104	22.69			159.00	\$2,360		\$1,908		\$4,268
D Dampers	20	ea	4	112	22.69			2500.00	\$2,540		\$50,000		\$52,540
D Additional Interior Doors 6'x6'-8"	4	ea	7.00	39	22.69			565.00	\$890		\$2,260		\$3,150
D Testing and balance of HVAC	1	lot	150	210	22.69				\$4,750				\$4,750
D Change-out/Airlock bldg walls	440	sf	0.065	40	22.69			1.37	\$910		\$603		\$1,513
D Change-out/Airlock bldg roof Framing	330	sf	0.065	30	22.69			0.44	\$680		\$145		\$825
D Change-out/Airlock bldg roof	330	sf	0.125	58	22.69			0.71	\$1,310		\$234		\$1,544
D Change-out/Airlock bldg door framing	2	ea	1.40	4	22.69			13.00	\$90		\$26		\$116
D Change-out/Airlock bldg door	2	ea	6.00	17	22.69			265.00	\$380		\$530		\$910
D Change-out/Airlock bldg insulation	770	sf	0.01	12	22.69			0.86	\$280		\$662		\$942
D HVAC transion Pieces	20	ea	6	168	22.69			2000	\$3,800		\$40,000		\$43,800
D HVAC Frame w/ filtered Louvers	8	ea	6.00	67	22.69			2500	\$1,520		\$20,000		\$21,520
D Rollup door	2	ea	30.00	84	22.69			3000	\$1,900		\$6,000		\$7,900
D Strip Curtain Door	1	ea	14.00	20	22.69			750.00	\$440		\$750		\$1,190
Overtime @ 25 % of construction labor	1	lot							\$23,283				\$23,283
Subtotal Direct Cost				8,209	\$25.52				209,500	0	487,600	0	\$697,100

PROJECT: Silo 3 Baseline  
ESTIMATE NO.: C4-2001-03-001  
CLIENT: DOE  
WBS NO.: 1.1.H.B

# DETAIL ESTIMATE WORKSHEETS

# FLUOR FERNALD

DATE: 16-May-01  
ESTIMATOR: Johnson  
LOCATION: Fernald  
TASK NO.: HS3AD

ITEM NO.	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Total	Rate	Labor	S/C	Mat'l					
D Stack	1	ea	120	168	\$23.60				\$3,960			\$100,000	\$103,960
D Water Tank 1000 gal w Agitator	3	ea	30	126	\$23.60				\$2,970			\$6,600	\$9,570
D Water Pump	2	ea	24	67	\$23.60				\$1,580			\$2,000	\$3,580
D Hopper w/ Bag Splitter	1	ea	25	35	\$23.60				\$820			\$20,000	\$20,820
D Screw Feeder Chute	2	ea	12	34	\$23.60				\$790			\$9,400	\$10,190
D Bin/Hopper (<=10 cy)	1	ea	25	35	\$23.60				\$820			\$10,000	\$10,820
D Load Cell	1	ea	20	28	\$23.60				\$660			\$5,500	\$6,160
D Ribbon Mixer	1	ea	40	56	\$23.60				\$1,320			\$115,400	\$116,720
D Screw Feeder (20 cf)	1	ea	65	91	\$23.60				\$2,140			\$40,000	\$42,140
D Drag Conveyor (40 lf)	1	ea	50	70	\$23.60				\$1,650			\$8,600	\$10,250
D Screw Feeder (20 cf)	1	ea	45	63	\$23.60				\$1,480			\$17,140	\$18,620
D Vecloder	1	ea	60	84	\$23.60				\$1,980			\$100,000	\$101,980
D Sump Pump	3	ea	20	84	\$23.60				\$1,980			\$2,400	\$4,380
D Water Laser	1	See	Site	Work									
D Excavator	1	ea	150	210	\$23.60				\$4,950			\$300,000	\$304,950
D Modifications-Remote	1	allow			\$23.60				\$100,000			\$100,000	\$100,000
D Winch	1	ea	10	14	\$23.60				\$330			\$200	\$530
D Excavator Under-Carriage Hopper/Conveyor	1	ea	100	140	\$23.60				\$3,300			\$100,000	\$103,300
D Sealand Containers	2	ea	25	70	\$23.60				\$1,650			\$30,000	\$31,650
D Breathing Air Trailers	1	ea	40	56	\$23.60				\$1,320			\$110,000	\$111,320
D Emergency Shower/Eyewash	1	ea	10	14	\$23.60				\$330			\$1,000	\$1,330
D HVAC Unit/Neg Air (4,000 CFM)	10	ea	12	168	\$23.60				\$3,960			\$82,000	\$85,960
D HVAC Unit/Neg Air (6,000 CFM)	9	ea	18	226	\$23.60				\$5,340			\$192,000	\$197,340
D Soil Feeder	1	ea	85	119	\$23.60				\$2,800			\$58,500	\$61,300
D CAT Testing	1	lot	200	200	\$23.60				\$4,720			\$4,720	\$4,720
D Overtime @ 25 % of construction Labor									\$8,569				\$8,569
D Startup support 4 people for 3 months	1	lot	2080	2080	\$23.60				\$49,100				\$49,100
D Radiant Heaters	10	ea	10	140	\$23.60				\$3,300			\$2,000	\$5,300
D Soil Conveying System	1	ea	130	182	\$23.60				\$4,290			\$75,000	\$79,290
D Scale and Hoppers	1	lot	45	63	\$23.60				\$1,480			\$28,000	\$29,480
D Drum Shredder Conveyor	1	ea	220	307	\$23.60				\$7,250			\$400,000	\$407,250
D Shredder Hood	1	ea	35	49	\$23.60				\$1,150			\$5,000	\$6,150
D Magnetic Separator	1	ea	150.0	210	\$23.60				\$4,950			\$200,000	\$204,950
D Freight @ 2.5 %												\$49,319	\$49,319
Subtotal Direct Cost				5,184					\$130,900			\$2,170,100	\$2,301,000

ESTIMATE NO.: C4-2001-03-001  
CLIENT: DOE  
WBS NO.: 1.1.H.B

DATE: 15-May-01  
ESTIMATOR: Johnson  
LOCATION: Fernald  
TASK NO.: HS3AD

# FLUOR FERNALD

[illegible]

# DETAIL ESTIMATE WORKSHEETS

## FLUOR FERNALD

PROJECT: Silo 3 Baseline  
ESTIMATE NO.: C4-2001-03-001  
CLIENT: DOE  
WBS NO.: 1.1.H.B

DATE: 15-May-01  
ESTIMATOR: Johnson  
LOCATION: Fernald  
TASK NO.: HS3AD

ITEM NO.	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Total	Rate	Labor	S/C	Mat'l					
D	1	lot	145	203	22.66			2185.00	\$4,590		\$2,330		\$0
D	9300	sf	0.01	91	22.66			0.27	\$2,060		\$2,680		\$6,920
D	9	ea	8.00	101	22.66			3900.00	\$2,280		\$37,450		\$4,740
D	1	ea	6.00	8	22.66			5.80	\$190		\$10		\$39,730
D	500	lf	0.04	28	22.66			0.25	\$630		\$130		\$200
D	9300	allow	0.01	65	22.66			0.14	\$1,470		\$1,420		\$760
D	990	lf	0	48	22.66			0.23	\$1,100		\$240		\$2,890
D	550	lf	0	61	22.66			1.36	\$1,390		\$800		\$1,340
D	1	ea	8	11	22.66			280	\$250		\$300		\$2,190
D	625	lf	0.46	405	22.66			7.76	\$9,180		\$5,170		\$14,350
D	1800	lf	0.08	201	22.66			1.36	\$4,560		\$2,610		\$7,170
D	990	lf	0.05	69	22.66			0.38	\$1,570		\$400		\$1,970
D	1450	lf	0.12	241	22.66			1.98	\$5,460		\$3,060		\$8,520
D	12	ea	3.30	55	22.66			1000	\$1,250		\$12,800		\$14,050
D	4	ea	4.40	25	22.66			1000	\$560		\$4,270		\$4,830
D	4	ea	1.80	10	22.66			200	\$230		\$850		\$1,080
D	5	ea	4.00	28	22.66			565	\$630		\$3,010		\$3,640
D	1	ea	4	6	22.66			1000	\$130		\$1,070		\$1,200
D	6	ea	3.60	30	22.66				\$680		\$0		\$680
D	80	lf	0.19	21	22.66			9.75	\$480		\$830		\$1,310
D	1595	lf	0.02	49	22.66			0.36	\$1,110		\$610		\$1,720
D	156	ea	0.03	7	22.66			0.09	\$160		\$10		\$170
D	300	lf	0.20	84	22.66			3.65	\$1,900		\$1,170		\$3,070
D	2150	lf	0.36	1093	22.66			6.38	\$24,780		\$14,640		\$39,420
D	2040	lf	0.042	120	22.66			0.47	\$2,710		\$1,020		\$3,730
D	216	ea	0.033	10	22.66			0.09	\$230		\$20		\$250
D	200	lf	0.046	13	22.66			0.55	\$290		\$120		\$410
D	1375	lf	0.0	77	22.66			1.25	\$1,740		\$1,830		\$3,570
D	1250	lf	0.27	471	22.66			3.27	\$10,690		\$4,360		\$15,050
D	100	ea	0.044	6	22.66			0.35	\$140		\$40		\$180
D	1	ea	12.0	17	22.66			560	\$380		\$600		\$980
D	4	ea	25.0	140	22.66				\$3,170		\$0	\$7,000	\$10,170
D	2	ea	120.0	335	22.66				\$7,600		\$0	\$60,000	\$67,600
D	1	lot	40.0	56	22.66				\$1,270		\$0	\$0	\$1,270
D	8	ea	15.0	168	22.66				\$3,800		\$0	\$20,000	\$23,800
D	22	ea	3.0	92	22.66			100.00	\$2,090		\$2,350		\$4,440
Subtotal Direct Cost													

# FLUOR FERNALD

DATE: 15-May-01  
ESTIMATOR: Johnson  
LOCATION: Fernald  
TASK NO.: HS3AD

ITEM NO.		QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
				Unit	Total	Rate	Labor	S/C	Mat'l					
D	Install 3' conduit w / fittings	60	If	1	80	22.66			\$1,800		\$1,520		\$3,320	
D	Power wire 4/0	200	If	0.044	12	22.66		23.72	\$280		\$490		\$770	
D	4/Oterminations	6	ea	2	17	22.66		2.30	\$380		\$520		\$900	
D	1-1/2 conduit w / fittings	80	If	0.325	36	22.66		81.67	\$820		\$300		\$1,120	
D	power wire 3#4w#8 grd	90	If	0.07	9	22.66		3.56	\$200		\$120		\$320	
D	Terminations	8	ea	0.267	3	22.66		1.20	\$70		\$10		\$80	
D	2" PVC conduit Ductbank	660	If	0.069	64	22.66		0.65	\$1,440		\$960		\$2,400	
D	Electrical Tracing	1	lot	60	84	22.66		1.36	\$1,900		\$14,400		\$16,300	
D	Auger holes for poles	1	ea	5.60	8	21.49		13500	\$170		\$170		\$170	
D	CAT Testing	1	lot	90	90	22.66			\$2,040				\$2,040	
	Startup support 4 people for 3 months	1	lot	2080	2080.00	22.66			\$47,140				\$47,140	
	Overtime @ 25 % of Construction costs	1	lot						\$13,476				\$13,476	
	Freight @ 2.5%											\$2,200		
	Subtotal Direct Cost	1	LOT		6,928	\$24,611.5			170,800		124,600	89,200	\$384,600	

# DETAIL ESTIMATE WORKSHEETS

# FLUOR FERNALD

PROJECT: Silo 3 Baseline  
ESTIMATE NO.: C4-2001-03-001  
CLIENT: DOE  
WBS NO.: 1.1.H.B

DATE: 15-May-01  
ESTIMATOR: Johnson  
LOCATION: Fernald  
TASK NO.: HS3AD

ITEM NO.	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Total	Rate	Labor	S/C	Mat'l					
D Radon Stack Monitor	1	ea	80,000	112	22.66				\$2,530			\$500,000	\$502,530
D Isokinetic Monitor	1	ea	60,000	84	22.66				\$1,900			\$100,000	\$101,900
D Process Instrumentation	1	lot	844	1179	22.66			35535	\$26,720		\$37,920		\$64,640
D Rad Monitoring Equipment-Tennelec	2	ea	18	50	22.66			27000	\$1,140		\$57,620		\$58,760
D Alpha Monitors	2	ea	24	67	22.66			35725	\$1,520		\$76,240		\$77,760
D Local Air Samplers	4	ea	4	22	22.66			1900	\$510		\$8,110		\$8,620
D Control system hardware	1	lot	50	70	22.66			16000	\$1,580		\$17,070		\$18,650
D Software purchase	1	lot		0	22.66			10000			\$10,670		\$10,670
D Software Testing	1	lot		0	22.66			25000			\$26,680		\$26,680
D Automatic Valves	1	lot						25000			\$26,680		\$26,680
CAT Tealing	1	lot	90,000	90	22.66				\$2,040			\$15,000	\$17,040
Overtime @ 25 % of Construction costs	1	lot							\$4,488				\$4,488
Freight @ 2.5%													
				1,674	\$25.33				42,400	0	261,000	615,000	\$918,400

# DETAIL ESTIMATE WORKSHEETS

# FLUOR FERNALD

PROJECT: Silo 3 Baseline  
ESTIMATE NO.: C4-2001-03-001  
CLIENT: DOE  
WBS NO.: 1.1.H.B

DATE: 15-May-01  
ESTIMATOR: Johnson  
LOCATION: Fernald  
TASK NO.: HS3AD

ITEM NO.	QTY	UNIT	MAN-HOURS			COST/UNIT			LABOR	S/C	MAT'L	EQUIP	TOTAL
			Unit	Total	Rate	Labor	S/C	Mat'l					
D	3450	sf	0.020	96	\$23.33			0.12	\$2,250		\$440		\$2,690
D	1245	sf	0.022	38	\$23.33			0.12	\$890		\$160		\$1,050
D	1	lot	127	177	\$23.33			625.00	\$4,140		\$670		\$4,810
D	9400	sf	0.03	407	\$23.33			0.52	\$9,500		\$5,220		\$14,720
Overtime @ 25 % of Construction costs													
	1	lot							\$2,098				\$2,098
									\$0	\$0	\$0	\$0	\$0
									18,900	0	5,600	0	\$25,400
Subtotal Direct Cost													
	1	LOT		719	\$26.28								



# FLUOR FERNALD

DATE: 15-May-01  
ESTIMATOR: Johnson  
LOCATION: Fernald  
TASK NO.: HS3AD

[illegible]



APPENDIX "A"

PROJECT: Silo 3 Baseline ESTIMATE NO:4-2001-03-001 CLIENT: DOE WBS NO.: 1.1.H.B		SITE SPECIFIC EFFICIENCY / MULTIPLIER ANALYSIS					DATE: 15-May-01 ESTIMATOR: Johnson LOCATION: Fernald TASK NO.: HS3AD						
PERCENT OF INFLUENCE ON CHART MANHOURS													
		40%	50%	60%	70%	80%	90%	100%	105%	110%	% OF INFLUENCE	WT'D VALUE	PROD. RESULT
CRAFT SKILL (NOTE 1)	POOR				FAIR								
CRAFT AVAIL.(NOTE 1)	POOR				FAIR								
CLIMATE (NOTE 2)	SEVERE	ICE/SNOW				RAIN							
PLANT ELEVATION		OVER 10,000FT				5,000' TO 10,000 FT							
WORK SPACE					200 SF	250 SF	300 SF	350 SF					
WORK WEEK								4-10s / 5-8s					
50 HOUR WORK WEEK					OVER 7 WEEKS	3 TO 7 WEEKS	UP TO 3 WEEKS						
60 HOUR WORK WEEK					OVER 7 WEEKS	UP TO 3 WEEKS							
SHIFTWORK													
2ND SHIFT						2ND SHIFT		OR					
3RD SHIFT					3RD SHIFT			ONE SHIFT ONLY					
PROJECT SIZE						400M MH AND UP	300M TO 400M MH	200M TO 300M MH	200M MH OR LESS				
PLANT TYPE						REVAMP ONLY	REVAMP & NEW	NEW IN EXIST PLT					
AREA/UNION INFLUENCE	STRONG			MILD		SOME		NONE					
												100.0%	87.0%
NOTES.....													
1. TURNOVER HAS BEEN CONSIDERED													
2. FOR EXTERIOR WORK ONLY													
EFFICIENCY (AS A % OFF CHART MANHOURS)												87.0%	
MULTIPLIER - ( TO BE APPLIED TO CHART M.H.'S TO OBTAIN SITE M.H.'S )												1.15	



## EFFICIENCY FACTORS

PROJECT: Silo 3 Baseline  
 ESTIMATE NO. C4-2001-03-001  
 CLIENT: DOE  
 WBS NO.: 1.1.H.B

DATE: 15-May-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HS3AD

# FLUOR FERNALD

## EXAMPLE:

STANDARD CHART MANHOURS = NET 100  
EFFICIENCY FACTORS:  
 \* SITE SPECIFIC (SEE APPENDIX A) 15% 15.0  
 S/T = BASE UNIT MANHOURS 115

OVERTIME PRODUCTIVITY FACTOR 0.00% 0  
 (SEE DETAIL WORKSHEET BACK-UP) 115

\* TASK SPECIFIC (confined space,  
 high elevation, congestion, etc.) 0.0% 0  
 115

\* PPE SPECIFIC (Based on current data  
 and estimating knowledge)

	PPE LEVEL									
	D		Mod. "D"		Mod. "C"		C		C+	
PRODUCTIVITY HOURS		MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's	MULTIPLIER	MH's
(AS A % ) /ADD MH's	10.00%	12	71.00%	82	79.00%	91	74.00%	85	96.00%	110
(AS A MULTIPLIER )TOTAL HRS	1.05	1.265	1.71	196.7	1.79	205.9	1.74	200.1	1.96	225.4
TOTAL MULTIPLIER w/SITE PROD.	1.265		196.7		205.9		2.001		2.254	

NOTE : Use the Default Productivity Factor of 'mC' for working  
 in a contaminated area if the Safety Level cannot be determined.

(SEE FD FERNALD ESTIMATING SERVICES REFERENCE MANUAL IM-6008 8.10)

Total hours worked in a specific PPE level divided by 10 hour working  
 days = (PPE) ManDays to determine material cost of PPE's.  
 (SEE APPENDIX C - HEALTH PHYSICS)

0.0	Man Days	20.0	Man Days	21.0	Man Days	20.0	Man Days	23.0	Man Days
-----	----------	------	----------	------	----------	------	----------	------	----------

THESE EFFICIENCY FACTORS WERE APPLIED INDIVIDUALLY  
 THROUGHOUT THE ESTIMATE AT A TASK SPECIFIC LEVEL,  
 TO OBTAIN A MORE ACCURATE ACCOUNT OF OVERALL  
 EFFICIENCY IMPACT DUE TO PPE REQUIREMENTS IN  
 HANDLING CONTAMINATED AND HAZARDOUS WASTE.

## EFFICIENCY FACTORS

PROJECT: Silo 3 Baseline  
 ESTIMATE NO. C4-2001-03-001  
 CLIENT: DOE  
 WBS NO.: 1.1.H.B

# FLUOR FERNALD

DATE: 15-May-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HS3AD

## PPE MULTIPLIER DEVELOPEMENT

		D	mD	mC	C	C+
CREW SIZE & MAKE-UP	STANDARD	7	7	7	7	7
	WORKER-BUDDY	0	0	0	0	0
	SUPPORT TEAM	0	0	0	0	0
	TOTAL CREW	7	7	7	7	7
CREW SIZE RATIO		1.00	1.00	1.00	1.00	1.00
AVAILABLE WORK TIME FACTOR		0.96	0.78	0.7	0.7	0.68
PPE LABOR PRODUCTIVITY FACTOR		1	1	0.86	0.82	0.75
NET PRODUCTIVITY RATIO		0.96	0.78	0.602	0.574	0.51
NET PRODUCTIVITY MULTIPLIER		1.04	1.28	1.65	1.74	1.96

These factors were based on Tables 6.1 and 6.2, Moderate Work Efforts, 66F to 85F temperature of 'Hazardous Waste Cost Control' by R.A.Selg. Modifications were made to reflect a 10 hour work day and no buddy system or support team for levels D, mC and C. The worker-buddy and support team members, if required, may be covered under Construction Mgmt. (Rad Techs).

AVAILABLE WORK TIME FACTOR		D	mD	mC	C	C+
TOTAL WORK MINUTES per D	4 - 10's	600	600	600	600	600
ADDITNL SITE SAFETY MEETINGS NOT INCLD. IN BASE	QUANTITY	1	1	1	1	1
	MINUTES	25	25	25	25	25
TOTAL		25	25	25	25	25
PPE DON & DOFFING (ADJUST LEVEL D per WORK PLAN)	QUANTITY	0	0	3	3	3
	MINUTES	0	0	15	15	20
TOTAL			0	45	45	60
WORK BREAKS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	2	2	2	2
	MINUTES	N/A	15	15	15	15
TOTAL			30	30	30	30
MOBILIZATION - ROUND TRIPS (ADJUST LEVEL D per WORK PLAN)	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL			60	60	60	60
COOLDOWNS PER DAY ** ( 4 OUT OF 12 MONTHS) 33.33%	QUANTITY	N/A	4	4	4	4
	MINUTES	N/A	15	15	15	15
TOTAL			20	20	20	20
AIR TANK REPLACEMENT	QUANTITY	N/A	N/A	N/A	N/A	N/A
	MINUTES	N/A	N/A	N/A	N/A	N/A
TOTAL						
AVAILABLE WORK TIME		575	465	420	420	405
AVAILABLE WORK TIME FACTOR		0.96	0.78	0.7	0.7	0.68

NOTE: Adjust 'Work Minutes per Day' basis to: 5 - 8's, or leave as 4 - 10's. Any other circumstances, over-ride the minutes per day.

\*\* Assumption based on work performed in May, June, July & August, pro-rating cost over one year. Adjust % to individual circumstances.

## HEALTH PHYSICS

PROJECT: Silo 3 Baseline  
 ESTIMATE NO.: C4-2001-03-001  
 CLIENT: DOE  
 WBS NO.: 1.1.H.B

**FLUOR FERNALD**

DATE: 15-May-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HS3AD

## PPE's - PERSONAL PROTECTIVE EQUIPMENT

DESCRIPTION	UNIT	UNIT COST	* NO. OF CHANGE OUTS PER WORKER PER DAY				
			Man Days (TOTAL HOURS worked in PPE's Div. by WORK HOURS / DAY)				
PPE LEVEL C / C+ / B : F/HF MASK w/RESP.&CART.		\$'s	*	MAN DAYS	MAT'L.\$'s	PPE LEVEL	(DOUBLE PPE)
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	3	72	\$963	C / C+	
TYVEK COVER-ALL w/HOOD & BOOTIES - DISPOSABLE	EA	4.46	3	72	\$963	C / C+	
GLOVE LINER - DISPOSABLE	PR	0.24	3	72	\$52	C / C+	
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	72	\$56	C / C+	
GLOVE, WORK - DISPOSABLE	PR	1.02	3	72	\$220	C / C+	
APR CARTRIDGES - DISPOSABLE	PR	6.98	3	72	\$1,508	C / C+	
SUB-TOTAL		17.42	3		\$3,762		

\$/MD = \$28.34

PPE LEVEL mC

FULL DRESS w/ FACE SHIELD		\$'s		MAN DAYS	MAT'L.\$'s	PPE LEVEL
LT.WT. DISPOSABLE COVERALLS W/HOOD & BOOTIES	PR	4.46	3	0	\$0	mC
GLOVE LINER - DISPOSABLE	PR	0.24	3	0	\$0	mC
GLOVE, LASTEX - DISPOSABLE	PR	0.26	3	0	\$0	mC
GLOVE, WORK - DISPOSABLE	PR	1.02	3	0	\$0	mC
<b>SUB-TOTAL</b>		<b>5.98</b>	<b>3</b>		<b>\$0</b>	

\$/MD = \$0.00

SUBCONTRACTOR REQUIRED PURCHASES	UNIT		QTY.	NO. OF			
			PER WKR.				
RUBBER BOOT COVERS-(1)PR.PER WORKER	PR	12.70	6	0	\$0	D/C/B	
APR w/HALF FACE MASK - (1) PER WORKER	EA	22.30	6	0	\$0	C	
APR w/FULL FACE MASK - (1) PER WORKER	EA	174.00	6	0	\$0	C	
SCBA	EA	1894.00	2	0	\$0	B	
COOL VESTS	EA	137.50	6	0	\$0	C/B	
THERMO STRIPS	EA	50.00	6	0	\$0	C/B	
<b>SUB-TOTAL</b>					<b>\$0</b>		

MAT'L.\$'s

\$3,800

TOTAL PPE's (FORWARD TO PAGE 2 OF 2)

OTHER PPE's SUCH AS HARD HAT, SAFETY GLASSES/GOGGLES, STEEL TOED SAFETY SHOES, HEARING PROTECTION, ARE CONSIDERED THE SUBCONTRACTORS RESPONSIBILITY AND ARE COVERED IN HIS OVERHEAD EXPENSE. COSTS OF FERNALD SUPPLIED PPE's, SUCH AS COTTON COVERALLS, EXCHANGE OF RUBBER BOOT COVERS AND RESPIRATORS FOR CHANGEOUTS AND CLEANING OF SAME IS INCURRED BY FD FERNALD AND COSTS ARE NOT INCLUDED AS PART OF PROJECT COSTS AT THIS TIME.

**HEALTH PHYSICS**

PROJECT: Silo 3 Baseline  
 ESTIMATE NO.: C4-2001-03-001  
 CLIENT: DOE  
 WBS NO.: 1.1.H.B

DATE: 15-May-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HS3AD

## -MEDICAL MONITORING -

## MEDICAL - PHYSICAL and IN-VIVO MONITORING - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
PHYSICAL (3hrs), IN-VIVO (1hr)						
BASELINE PHYSICALS	1	4	1	4	\$25.21	\$100
ANNUAL PHYSICALS	0	4	1	0	\$25.21	\$0
EXIT (TERMINATION) PHYSICALS (IN-VIVO)	1	1	1	1	\$25.21	\$30
SUB-TOTAL						\$130

## RADIATION IN-VITRO SURVEILLANCE - LOST WORKER TIME for RAD II WORKERS ONLY

DESC.	QTY	HRS	WKR	TOTAL HOURS	AVG. LABOR RATE	TOTAL LABOR \$
BI-MONTHLY BIOASSAY	4	1	1	4	\$25.21	\$90
SUB-TOTAL						\$90

## RANDOM DRUG TESTING

	TESTS	HRS	TOTAL HOURS	AVG. RATE	LABOR \$'s	
	25	2	50	\$25.21	\$1,300	
NO. OF WKRS. TESTED	TESTING DAYS PER YR.	AVG. NO. OF TESTS PER DAY	CHANCE/ DAY FOR TEST	NO. OF WKRS. FOR THIS ESTIMATE	CHANCES /DAY FOR TEST FOR PROJECT	CONSTR WORKING DAYS
2340	226	10	0.0042735	41	0.1752	140

			LABOR \$'s THRU SAFETY	LABOR \$'s
WORK DELAYS CAUSED BY MONITORING	0.5%		\$1,073,200	\$5,400
				LABOR \$'s
WORK DELAYS CAUSED BY RAD CHECKING	0.5%		\$1,073,200	\$5,400

	TOTAL LABOR	TOTAL MAT'L.	GRAND TOTAL
TOTAL HEALTH PHYSICS - FORWARD TO ESTIMATE SUMMARY SHEET	\$12,300	\$3,800	\$16,100



# ACTIVITY DURATIONS

## **FLUOR FERNALD**

PROJECT: Silo 3 Baseline  
 ESTIMATE NO.: C4-2001-03-001  
 CLIENT: DOE  
 WBS NO.: 1.1.H.B

DATE: 15-May-01  
 ESTIMATOR: Johnson  
 LOCATION: Fernald  
 TASK NO.: HS3AD

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
CONSTRUCTION:	03-May-01	15-May-02	04-Sep-02	26-Dec-02	7.4	MONTHS
					0	MONTHS
TOTAL					7.4	MONTHS

DATE of EST. to MID-POINT ACTIVITY DURATION		
a.	16.1	MONTHS
b.	0	MONTHS

ACTIVITY	EST. DATE	START DATE	MID POINT	COMPL. DATE	ACTIVITY	DURATION
OPERATIONS					0	MONTHS

DATE of EST. to MID-POINT ACTIVITY DURATION		
	0	MONTHS

ACTIVITY DURATION IS USED IN DETERMINING NUMBER of WORKERS for CERCLA/SAT TRAINING HOURS and HEALTH PHYSICS COSTS.



**HS3AE**

**STARTUP/STARTUP REVIEW**



**Fluor Fernald, Inc.**

PBS: 7

DATE: SEP 5, 2001

WBS: 11.HB.SIIO3

PROJECT MGR: Robert Fellman

CTRL ACCT:	HS3A	SII O3
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20
21	21	21
22	22	22
23	23	23
24	24	24
25	25	25
26	26	26
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28	28	28
29	29	29
30	30	30
31	31	31
32	32	32
33	33	33
34	34	34
35	35	35
36	36	36
37	37	37
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40	40	40
41	41	41
42	42	42
43	43	43
44	44	44
45	45	45
46	46	46
47	47	47
48	48	48
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51	51	51
52	52	52
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54	54	54
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64	64	64
65	65	65
66	66	66
67	67	67
68	68	68
69	69	69
70	70	70
71	71	71
72	72	72
73	73	73
74	74	74
75	75	75
76	76	76
77	77	77
78	78	78
79	79	79
80	80	80
81	81	81
82	82	82
83	83	83
84	84	84
85	85	85
86	86	86
87	87	87
88	88	88
89	89	89
90	90	90
91	91	91
92	92	92
93	93	93
94	94	94
95	95	95
96	96	96
97	97	97
98	98	98
99	99	99
100	100	100

CAM: Robert Fellman

CHARGE NO: HS3AE STARTUP/STARTUP REVIEW

(1 FTE EQUALS 1747 HOURS)

COMMENTS: F07-025, F07-028

[illegible][illegible][illegible][illegible][illegible]

# Fluor Fernald, Inc.

7

DATE: SEP 5, 2001

WBS: 1.1.HB SILO 3

ESTIMATE SUPPORT WORKSHEET

PROJECT MGR: Robert Fellman

CTRL ACCT: HS3A SILO 3

FOR ACTIVITY BASED ESTIMATING

CAM: Robert Fellman

CHARGE NO: HS3AE STARTUP/STARTUP REVIEW

(1 FTE EQUALS 1747 HOURS)

PREPARED BY: Karen Winitz

COMMENTS: F07-025, F07-028

FISCAL YEAR: FY01 - FY05

Yr Total Cost:	0	0	18,023	59,799	0	0	0	0	0	0
Cum Total Cost:	0	0	18,023	77,822	77,822	77,822	77,822	77,822	77,822	77,822

Resource:	ENGMEC	ENGINEER MECH/PIPING	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	

Yr Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:	0.0	0.0	953.6	478.5	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	953.6	1,432.1	1,432.1	1,432.1	1,432.1	1,432.1	1,432.1	1,432.1
Cum Total Cost:	0	0	66,107	35,124	0	0	0	0	0	0
	0	0	66,107	101,232	101,232	101,232	101,232	101,232	101,232	101,232

Resource:	FPRENG	FIRE PROTECTION ENG	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	

Yr Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:	0.0	0.0	364.3	119.6	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	364.3	483.9	483.9	483.9	483.9	483.9	483.9	483.9
Cum Total Cost:	0	0	17,619	6,126	0	0	0	0	0	0
	0	0	17,619	23,745	23,745	23,745	23,745	23,745	23,745	23,745

Resource:	HAZWAT	HAZWAT	EOC:	LABOR
Res Dept:	943	Overtime:	HOU	

Yr Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:	0.0	0.0	773.7	2,423.2	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	773.7	3,197.0	3,197.0	3,197.0	3,197.0	3,197.0	3,197.0	3,197.0
Cum Total Cost:	0	0	24,835	82,366	0	0	0	0	0	0
	0	0	24,835	107,201	107,201	107,201	107,201	107,201	107,201	107,201

Resource:	HEOOPR	HEAVY EQUIP OPERATOR	EOC:	LABOR
Res Dept:	943	Overtime:	HOU	

Yr Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:	0.0	0.0	2,393.2	6,462.6	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	2,393.2	8,855.8	8,855.8	8,855.8	8,855.8	8,855.8	8,855.8	8,855.8
Cum Total Cost:	0	0	83,940	240,036	0	0	0	0	0	0
	0	0	83,940	323,976	323,976	323,976	323,976	323,976	323,976	323,976

Resource:	INDHYG	INDUSTRIAL HYGIENIST	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	

Yr Hours:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Cum Hours:	0.0	0.0	2,393.2	6,462.6	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	83,940	240,036	0	0	0	0	0	0
Cum Total Cost:	0	0	83,940	323,976	323,976	323,976	323,976	323,976	323,976	323,976

# Fluor Fernald, Inc.

PBS: 7

DATE: SEP 5, 2001

WBS: 1.1.H.B SILO 3

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)PROJECT MGR: Robert Fellman  
CAM: Robert Fellman

CTRL ACCT: HS3A SILO 3

CHARGE NO: HS3AE STARTUP/STARTUP REVIEW

PREPARED BY: Karen Wintz

COMMENTS: F07-025, F07-028

FISCAL YEAR: FY01 - FY05

	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Hours:	0.0	0.0	515.8	1,616.1	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	515.8	2,132.0	2,132.0	2,132.0	2,132.0	2,132.0	2,132.0	2,132.0
Yr Total Cost:	0	0	17,926	59,474	0	0	0	0	0	0
Cum Total Cost:	0	0	17,926	77,400	77,400	77,400	77,400	77,400	77,400	77,400

Resource: MAT300  
Res Dept: 943

MATERIAL OBJCLASS300  
OverTime: 943

Class: MATERIAL

EOC: MAT

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Units:	0.0	0.0	515,664.1	251,835.9	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	0.0	515,664.1	767,500.0	767,500.0	767,500.0	767,500.0	767,500.0	767,500.0	767,500.0
Yr Total Cost:	0	0	543,886	273,056	0	0	0	0	0	0
Cum Total Cost:	0	0	543,886	816,942	816,942	816,942	816,942	816,942	816,942	816,942

Resource: MILLWRT  
Res Dept: 943

MILLWRIGHT  
OverTime: 943

Class: LABOR

EOC: HOU

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	845.7	1,616.1	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	845.7	2,461.9	2,461.9	2,461.9	2,461.9	2,461.9	2,461.9	2,461.9
Yr Total Cost:	0	0	29,465	59,627	0	0	0	0	0	0
Cum Total Cost:	0	0	29,465	89,092	89,092	89,092	89,092	89,092	89,092	89,092

Resource: MNTMGR  
Res Dept: 943

MAINTENANCE MGR  
OverTime: 943

Class: LABOR

EOC: SAL

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	1,046.7	1,212.1	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	1,046.7	2,258.8	2,258.8	2,258.8	2,258.8	2,258.8	2,258.8	2,258.8
Yr Total Cost:	0	0	52,021	63,796	0	0	0	0	0	0
Cum Total Cost:	0	0	52,021	115,817	115,817	115,817	115,817	115,817	115,817	115,817

Resource: MNTREP  
Res Dept: 943

MAINTENANCE REP  
OverTime: 943

Class: LABOR

EOC: SAL

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	788.8	405.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	788.8	1,193.8	1,193.8	1,193.8	1,193.8	1,193.8	1,193.8	1,193.8
Yr Total Cost:	0	0	30,558	16,617	0	0	0	0	0	0
Cum Total Cost:	0	0	30,558	47,176	47,176	47,176	47,176	47,176	47,176	47,176

Resource: MVOOPR  
Res Dept: 943

MOTOR VEHICLE OPER  
OverTime: 943

Class: LABOR

EOC: HOU

**Fluor Fernald, Inc.**

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PBS: 7

DATE: SEP 5, 2001

WBS:	1.1.H.B	SILO 3
CTRL ACCT:	HS3A	SILO 3
CHARGE NO:	HS3AE	STARTUP/STARTUP REVIEW
COMMENTS:	F07-025, F07-028	

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

[illegible]

Resource:	OILERM	OILER MAINTENANCE	EOC:	LABOR
Res Dept:	943	OverTime:	HOU	
		Class:		

[illegible]

Resource:	OPRMGR	OPERATIONS MGR	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	
		Class:		

[illegible]

Resource:	PAINTR	EOC:	LABOR
Res Dept:	943	Overline:	HOU
		Class:	

[illegible]

Resource:	PIPFTR	PIPE FITTER	EOC:	LABOR
Res Dept:	943	Overtime:	HOU	
		Class:		

[illegible]



## 2

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SIL03

SIL03

START

COMMENTS: F07-025, F07-028

5	1	1
5	1	1
4	1	1
5	1	1
j	1	1
0	1	1

PROJECT MGR: Robert Fellman

CAM: Robert Fellman

PREPARED BY: Karen Wintz

[illegible][illegible][illegible][illegible]

Resource:	RADMGR										
Res Dept:	943										
Overline:		Class:									LABOR
		Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-

# Fluor Fernald, Inc.

PBS: 7

DATE: SEP 5, 2001

WBS: 1.1.H.B SILO 3  
 CTRL ACCT: HS3A SILO 3  
 CHARGE NO: HS3AE STARTUP/STARTUP REVIEW  
 COMMENTS: F07-025, F07-028

ESTIMATE SUPPORT WORKSHEET  
 FOR ACTIVITY BASED ESTIMATING  
 (1 FTE EQUALS 1747 HOURS)

PROJECT MGR: Robert Fellman  
 CAM: Robert Fellman  
 PREPARED BY: Karen Wintz  
 FISCAL YEAR: FY01 - FY05

	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Hours:	0.0	0.0	257.9	808.1	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	257.9	1,066.0	1,066.0	1,066.0	1,066.0	1,066.0	1,066.0	1,066.0
Yr Total Cost:	0	0	17,198	57,061	0	0	0	0	0	0
Cum Total Cost:	0	0	17,198	74,259	74,259	74,259	74,259	74,259	74,259	74,259

Resource: RADTEC  
 Res Dept: 943

RAD TECH  
 Overtime:

EOC: SAL  
 Class: LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	1,418.5	5,654.5	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	1,418.5	7,073.0	7,073.0	7,073.0	7,073.0	7,073.0	7,073.0	7,073.0
Yr Total Cost:	0	0	53,897	227,513	0	0	0	0	0	0
Cum Total Cost:	0	0	53,897	281,410	281,410	281,410	281,410	281,410	281,410	281,410

Resource: RIGGER  
 Res Dept: 943

RIGGER  
 Overtime:

EOC: HOU  
 Class: LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	515.8	1,616.1	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	515.8	2,132.0	2,132.0	2,132.0	2,132.0	2,132.0	2,132.0	2,132.0
Yr Total Cost:	0	0	18,092	60,028	0	0	0	0	0	0
Cum Total Cost:	0	0	18,092	78,120	78,120	78,120	78,120	78,120	78,120	78,120

Resource: S&HENG  
 Res Dept: 943

SAFETY ENGINEER  
 Overtime:

EOC: SAL  
 Class: LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	183.5	808.1	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	183.5	991.6	991.6	991.6	991.6	991.6	991.6	991.6
Yr Total Cost:	0	0	10,172	47,425	0	0	0	0	0	0
Cum Total Cost:	0	0	10,172	57,597	57,597	57,597	57,597	57,597	57,597	57,597

Resource: SERV/SUB  
 Res Dept: 943

SUBS  
 Overtime: cole

EOC: SUB  
 Class: SUBCONTRACTORS

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Units:	0.0	0.0	167,157.9	58,965.1	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	0.0	167,157.9	226,143.0	226,143.0	226,143.0	226,143.0	226,143.0	226,143.0	226,143.0
Yr Total Cost:	0	0	176,306	63,955	0	0	0	0	0	0
Cum Total Cost:	0	0	176,306	240,262	240,262	240,262	240,262	240,262	240,262	240,262

7

**ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)**

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

Resource: TECWRT  
Res Dept: 943  
Class: TECHNICAL WRITER  
EOC: SAL  
LABOR

Resource: TPFO  
Res Dept: 943  
Team Partner Home of  
Overtime:  
Class:  
EOC: TP  
LABOR

Resource: TPSREP  
Res Dept: 943

TECH/PROG SUPT REP  
Overtime:

EOC:  
SAL

Class:

LABOR

Resource:	TRNLAB	EOC:	LABOR
Res Dept:	943	HOU	
		Class:	
		TRANSPORT LABORER	
		Overtime:	

Resource: TRNREP  
Res Dept: 943

TRAINING REP  
Overtime:

EOC:  
SAL

LABOR

**Fluor Fernald, Inc.**

7

PBS: 1.1.H.B SILO 3  
 CTRL ACCT: HS3A SILO 3  
 CHARGE NO: HS3AE STARTUP/STARTUP REVIEW  
 COMMENTS: F07-025, F07-028

DATE: SEP 5, 2001  
 PROJECT MGR: Robert Fellman  
 CAM: Robert Fellman  
 PREPARED BY: Karen Wintz  
 FISCAL YEAR: FY01 - FY05

ESTIMATE SUPPORT WORKSHEET  
 FOR ACTIVITY BASED ESTIMATING  
 (1 FTE EQUALS 1747 HOURS)

Cum Hours: 0.0 0.0 0.0 0.0 880.7 880.7 880.7 880.7 880.7 880.7  
 Yr Total Cost: 0 0 22,263 20,075 0 0 0 0 0 0  
 Cum Total Cost: 0 0 22,263 42,338 42,338 42,338 42,338 42,338 42,338 42,338

Resource: WELDER  
 Res Dept: 943

WELDER  
 Overtime:

EOC:  
 HOU

LABOR

Class: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

Oct 00-  
 Sep 01 0.0  
 Sep 02 0.0  
 Yr Total Cost: 0  
 Cum Total Cost: 0

Oct 01-  
 Sep 02 0.0  
 Oct 02-  
 Sep 03 129.0  
 Sep 04 602.0  
 Yr Total Cost: 731.0  
 Cum Total Cost: 22,361

Oct 03-  
 Sep 04 731.0  
 Oct 04-  
 Sep 05 731.0  
 Oct 05-  
 Sep 06 731.0  
 Sep 07 731.0  
 Yr Total Cost: 26,884  
 Cum Total Cost: 26,884

Oct 06-  
 Sep 07 731.0  
 Oct 07-  
 Sep 08 731.0  
 Sep 09 731.0  
 Yr Total Cost: 26,884  
 Cum Total Cost: 26,884

Oct 08-  
 Sep 09 731.0  
 Oct 09-  
 Sep 10 731.0  
 Yr Total Cost: 26,884  
 Cum Total Cost: 26,884

Resource: WSTENG  
 Res Dept: 943

WASTE ENGINEER  
 Overtime:

EOC:  
 SAL

LABOR

Class: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

Oct 00-  
 Sep 01 0.0  
 Sep 02 0.0  
 Yr Total Cost: 0  
 Cum Total Cost: 0

Oct 01-  
 Sep 02 0.0  
 Oct 02-  
 Sep 03 645.4  
 Sep 04 405.0  
 Yr Total Cost: 1,050.4  
 Cum Total Cost: 24,402

Oct 03-  
 Sep 04 1,050.4  
 Oct 04-  
 Sep 05 1,050.4  
 Oct 05-  
 Sep 06 1,050.4  
 Sep 07 1,050.4  
 Yr Total Cost: 61,121  
 Cum Total Cost: 61,121

Oct 06-  
 Sep 07 1,050.4  
 Oct 07-  
 Sep 08 1,050.4  
 Sep 09 1,050.4  
 Yr Total Cost: 61,121  
 Cum Total Cost: 61,121

Oct 08-  
 Sep 09 1,050.4  
 Oct 09-  
 Sep 10 1,050.4  
 Yr Total Cost: 61,121  
 Cum Total Cost: 61,121

**GRAND TOTALS:**

Cum Hours: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0  
 Yr Total Cost: 0 0 32,006.2 32,006.2 82,992.0 82,992.0 82,992.0 82,992.0 82,992.0 82,992.0  
 Cum Total Cost: 0 0 32,006.2 64,012.4 146,998.4 229,990.4 312,982.4 395,974.4 478,966.4 561,958.4

CAM

*Robert Fellman*

CONTROL TEAM

*Robert Fellman*

**HS3AF**

**REMEDIAL ACTION**



# Fluor Fernald, Inc.

7

DATE: SEP 5, 2001

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

PBS: 7  
WBS: 1.1.H.B SILO 3  
CTRL ACCT: HS3A SILO 3  
CHARGE NO: HS3AF REMEDIAL ACTION  
COMMENTS: F07-025

Resource: BUYCON  
Res Dept: 943

BUYER/CONTRACTS ADMIN  
Overline: Class: EOC: SAL

LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	1,148.9	697.8	0.0	1,846.7	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	1,148.9	1,846.7	1,846.7	1,846.7	1,846.7	1,846.7	1,846.7
Yr Total Cost:	0	0	0	56,835	36,565	0	0	0	0	0
Cum Total Cost:	0	0	0	56,835	93,401	93,401	93,401	93,401	93,401	93,401

Resource: CHMOPR  
Res Dept: 943

CHEMICAL OPERATOR  
Overline: Class: EOC: HOU

LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	9,191.4	5,582.4	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	9,191.4	14,773.8	14,773.8	14,773.8	14,773.8	14,773.8	14,773.8
Yr Total Cost:	0	0	0	338,571	217,821	0	0	0	0	0
Cum Total Cost:	0	0	0	338,571	556,392	556,392	556,392	556,392	556,392	556,392

Resource: CRPNTR  
Res Dept: 943

CARPENTER  
Overline: Class: EOC: HOU

LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	344.7	209.3	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	344.7	554.0	554.0	554.0	554.0	554.0	554.0
Yr Total Cost:	0	0	0	12,603	8,108	0	0	0	0	0
Cum Total Cost:	0	0	0	12,603	20,711	20,711	20,711	20,711	20,711	20,711

Resource: ELECTN  
Res Dept: 943

ELECTRICIAN  
Overline: Class: EOC: HOU

LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	2,297.9	1,395.6	0.0	3,693.5	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	2,297.9	3,693.5	3,693.5	3,693.5	3,693.5	3,693.5	3,693.5
Yr Total Cost:	0	0	0	85,023	54,699	0	0	0	0	0
Cum Total Cost:	0	0	0	85,023	139,722	139,722	139,722	139,722	139,722	139,722

Resource: ENGINR  
Res Dept: 943

ENGINEER  
Overline: Class: EOC: SAL

LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	1,148.9	697.8	0.0	1,846.7	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	1,148.9	1,846.7	1,846.7	1,846.7	1,846.7	1,846.7	1,846.7
Yr Total Cost:	0	0	0	93,270	60,005	0	0	0	0	0

PBS: 7

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
	Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	1,395.6	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	2,297.9	3,693.5	3,693.5	3,693.5	3,693.5	3,693.5	3,693.5
Yr Total Cost:	0	0	0	151,869	97,705	0	0	0	0	0
Cum Total Cost:	0	0	0	151,869	249,574	249,574	249,574	249,574	249,574	249,574

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr. Hours:	0.0	0.0	0.0	229.8	139.6	0.0	0.0	0.0	0.0	0.0
Cum. Hours:	0.0	0.0	0.0	229.8	369.3	369.3	369.3	369.3	369.3	369.3
Yr. Total Cost:	0	0	0	7,683	4,943	0	0	0	0	0
Cum. Total Cost:	0	0	0	7,683	12,626	12,626	12,626	12,626	12,626	12,626

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr. Hours:	0.0	0.0	0.0	114.9	69.8	0.0	0.0	0.0	0.0	0.0
Cum. Hours:	0.0	0.0	0.0	114.9	184.7	184.7	184.7	184.7	184.7	184.7
Yr. Total Cost:	0	0	0	5,884	3,786	0	0	0	0	0
Cum. Total Cost:	0	0	0	5,884	9,670	9,670	9,670	9,670	9,670	9,670

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	5,744.6	3,489.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	5,744.6	9,233.6	9,233.6	9,233.6	9,233.6	9,233.6	9,233.6
Yr Total Cost:	0	0	0	195,262	125,622	0	0	0	0	0
Cum Total Cost:	0	0	0	195,262	320,884	320,884	320,884	320,884	320,884	320,884

Oct 00	Oct 01	Oct 02	Oct 03	Oct 04	Oct 05	Oct 06	Oct 07	Oct 08	Oct 09
Sep 01	Sep 02	Sep 03	Sep 04	Sep 05	Sep 06	Sep 07	Sep 08	Sep 09	Sep 10



# Fluor Fernald, Inc.

PBS: 7

DATE: SEP 5, 2001

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

WBS: 1.1.HB SILO 3  
CTRL ACCT: HS3A SILO 3  
CHARGE NO: HS3AF REMEDIAL ACTION  
COMMENTS: F07-025

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

Resource: INDHYG  
Res Dept: 943  
Yr Hours: 0.0  
Cum Hours: 0.0  
Yr Total Cost: 0  
Cum Total Cost: 0

Resource: INDHYG  
Res Dept: 943  
Yr Hours: 0.0  
Cum Hours: 0.0  
Yr Total Cost: 0  
Cum Total Cost: 0

Resource: INSMEC  
Res Dept: 943  
Yr Hours: 0.0  
Cum Hours: 0.0  
Yr Total Cost: 0  
Cum Total Cost: 0

Resource: INSTRUMENT MECHANIC  
Res Dept: 943  
Yr Hours: 0.0  
Cum Hours: 0.0  
Yr Total Cost: 0  
Cum Total Cost: 0

Resource: LABCHM  
Res Dept: 943  
Yr Hours: 0.0  
Cum Hours: 0.0  
Yr Total Cost: 0  
Cum Total Cost: 0

Resource: CHEMIST  
Res Dept: 943  
Yr Hours: 0.0  
Cum Hours: 0.0  
Yr Total Cost: 0  
Cum Total Cost: 0

Resource: MAT300  
Res Dept: 943  
Yr Hours: 0.0  
Cum Hours: 0.0  
Yr Total Cost: 0  
Cum Total Cost: 0

Resource: MATERIAL OBJCLASS300  
Res Dept: 943  
Yr Hours: 0.0  
Cum Hours: 0.0  
Yr Total Cost: 0  
Cum Total Cost: 0

Resource: MCHNST  
Res Dept: 943  
Yr Hours: 0.0  
Cum Hours: 0.0  
Yr Total Cost: 0  
Cum Total Cost: 0

Resource: MACHINIST  
Res Dept: 943  
Yr Hours: 0.0  
Cum Hours: 0.0  
Yr Total Cost: 0  
Cum Total Cost: 0

# Fluor Fernald, Inc.

PBS: 7

DATE: SEP 5, 2001

WBS: 1.1.H.B SILO 3

PROJECT MGR: Robert Fellman

CTRL ACCT: HS3A SILO 3

CAM: Robert Fellman

CHARGE NO: HS3AF REMEDIAL ACTION

PREPARED BY: Karen Wintz

COMMENTS: F07-025 F07-060

FISCAL YEAR: FY01 - FY05

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

Resource: MILWRT  
Res Dept: 943

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	114.9	69.8	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	114.9	184.7	184.7	184.7	184.7	184.7	184.7
Yr Total Cost:	0	0	0	4,267	2,745	0	0	0	0	0
Cum Total Cost:	0	0	0	4,267	7,013	7,013	7,013	7,013	7,013	7,013

Resource: MILWRT  
Res Dept: 943

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	2,297.9	1,395.6	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	2,297.9	3,693.5	3,693.5	3,693.5	3,693.5	3,693.5	3,693.5
Yr Total Cost:	0	0	0	84,778	54,542	0	0	0	0	0
Cum Total Cost:	0	0	0	84,778	139,321	139,321	139,321	139,321	139,321	139,321

Resource: MNTMGR  
Res Dept: 943

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	1,723.4	1,046.7	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	1,723.4	2,770.1	2,770.1	2,770.1	2,770.1	2,770.1	2,770.1
Yr Total Cost:	0	0	0	90,706	58,356	0	0	0	0	0
Cum Total Cost:	0	0	0	90,706	149,062	149,062	149,062	149,062	149,062	149,062

Resource: MNTREP  
Res Dept: 943

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	574.5	348.9	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	574.5	923.4	923.4	923.4	923.4	923.4	923.4
Yr Total Cost:	0	0	0	23,568	15,163	0	0	0	0	0
Cum Total Cost:	0	0	0	23,568	38,731	38,731	38,731	38,731	38,731	38,731

Resource: MVOOPR  
Res Dept: 943

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	2,297.9	1,395.6	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	2,297.9	3,693.5	3,693.5	3,693.5	3,693.5	3,693.5	3,693.5
Yr Total Cost:	0	0	0	78,295	50,371	0	0	0	0	0
Cum Total Cost:	0	0	0	78,295	128,666	128,666	128,666	128,666	128,666	128,666

# Fluor Fernald, Inc.

PBS: 7

DATE: SEP 5, 2001

WBS: 1.1.H.B SILO 3  
CTRL ACCT: HS3A SILO 3  
CHARGE NO: HS3AF REMEDIAL ACTION  
COMMENTS: F07-025 F07-060

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

Resource: OILERM  
Res Dept: 943

OILER MAINTENANCE  
Overline:

	Class:		EOC:		LABOR	
	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07
Yr Hours:	0.0	0.0	114.9	69.8	0.0	0.0
Cum Hours:	0.0	0.0	114.9	184.7	184.7	184.7
Yr Total Cost:	0	0	3,604	2,319	0	0
Cum Total Cost:	0	0	3,604	5,923	5,923	5,923

Resource: OPRMGR  
Res Dept: 943

OPERATIONS MGR  
Overline:

	Class:		EOC:		LABOR	
	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07
Yr Hours:	0.0	0.0	5,744.6	3,489.0	0.0	0.0
Cum Hours:	0.0	0.0	5,744.6	9,233.6	9,233.6	9,233.6
Yr Total Cost:	0	0	354,578	228,118	0	0
Cum Total Cost:	0	0	354,578	582,696	582,696	582,696

Resource: PAINTR  
Res Dept: 943

PAINTER  
Overline:

	Class:		EOC:		LABOR	
	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07
Yr Hours:	0.0	0.0	114.9	69.8	0.0	0.0
Cum Hours:	0.0	0.0	114.9	184.7	184.7	184.7
Yr Total Cost:	0	0	4,267	2,745	0	0
Cum Total Cost:	0	0	4,267	7,013	7,013	7,013

Resource: PIPEFTR  
Res Dept: 943

PIPE FITTER  
Overline:

	Class:		EOC:		LABOR	
	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07
Yr Hours:	0.0	0.0	2,297.9	1,395.6	0.0	0.0
Cum Hours:	0.0	0.0	2,297.9	3,693.5	3,693.5	3,693.5
Yr Total Cost:	0	0	84,724	54,508	0	0
Cum Total Cost:	0	0	84,724	139,232	139,232	139,232

Resource: PJSREPR  
Res Dept: 943

PROJECT SUPPORT REP  
Overline:

	Class:		EOC:		LABOR	
	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07
Yr Hours:	0.0	0.0	1,838.3	1,116.5	0.0	0.0
Cum Hours:	0.0	0.0	1,838.3	2,954.8	2,954.8	2,954.8
Yr Total Cost:	0	0	88,484	56,927	0	0
Cum Total Cost:	0	0	88,484	139,232	139,232	139,232

# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

7

DATE: SEP 5, 2001

PBS: 1.1.HB SILO 3  
CTRL ACCT: HS3A SILO 3  
CHARGE NO: HS3AF REMEDIAL ACTION  
COMMENTS: F07-025 F07-060

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

Cum Total Cost: 0 0 0 88,484 145,411 145,411 145,411 145,411 145,411

Resource: PROMGR  
Res Dept: 943  
PROGRAM MGR  
Overtime: EOC: SAL

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	344.7	209.3	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	344.7	554.0	554.0	554.0	554.0	554.0	554.0
Yr Total Cost:	0	0	0	38,256	24,612	0	0	0	0	0
Cum Total Cost:	0	0	0	38,256	62,868	62,868	62,868	62,868	62,868	62,868

Resource: QACENG  
Res Dept: 943  
QA ENGINEER  
Overtime: EOC: SAL

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	1,148.9	697.8	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	1,148.9	1,846.7	1,846.7	1,846.7	1,846.7	1,846.7	1,846.7
Yr Total Cost:	0	0	0	62,343	40,108	0	0	0	0	0
Cum Total Cost:	0	0	0	62,343	102,451	102,451	102,451	102,451	102,451	102,451

Resource: RADENG  
Res Dept: 943  
RAD ENGINEER  
Overtime: EOC: SAL

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	1,723.4	1,046.7	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	1,723.4	2,770.1	2,770.1	2,770.1	2,770.1	2,770.1	2,770.1
Yr Total Cost:	0	0	0	96,037	61,786	0	0	0	0	0
Cum Total Cost:	0	0	0	96,037	157,823	157,823	157,823	157,823	157,823	157,823

Resource: RADMGR  
Res Dept: 943  
RAD SUPERVISOR/MGR  
Overtime: EOC: SAL

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	1,148.9	697.8	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	1,148.9	1,846.7	1,846.7	1,846.7	1,846.7	1,846.7	1,846.7
Yr Total Cost:	0	0	0	81,130	52,195	0	0	0	0	0
Cum Total Cost:	0	0	0	81,130	133,325	133,325	133,325	133,325	133,325	133,325

Resource: RADTEC  
Res Dept: 943  
RAD TECH  
Overtime: EOC: SAL


	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	1,148.9	697.8	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	1,148.9	1,846.7	1,846.7	1,846.7	1,846.7	1,846.7	1,846.7
Yr Total Cost:	0	0	0	81,130	52,195	0	0	0	0	0
Cum Total Cost:	0	0	0	81,130	133,325	133,325	133,325	133,325	133,325	133,325

## 2

DATE: SEP 5, 2001

**ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)**

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

Resource:	TPSREP	TECH/PROG SUPT REP	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	
				
XQU4FY01REBASELINE\ABE\HS3A_CR_5SEP01.xls				

**Fluor Fernald, Inc.**

PBS: 7

WBS: 1.1.H.B SILO 3

CTRL ACCT: HS3A SILO 3  
 CHARGE NO: HS3AF REMEDIAL ACTION  
 COMMENTS: F07-025 F07-060

DATE: SEP 5, 2001  
 PROJECT MGR: Robert Fellman  
 CAM: Robert Fellman  
 PREPARED BY: Karen Wintz  
 FISCAL YEAR: FY01 - FY05

ESTIMATE SUPPORT WORKSHEET  
 FOR ACTIVITY BASED ESTIMATING  
 (1 FTE EQUALS 1747 HOURS)

Resource:	TRNLAB Res Dept: 943	TRANSPORT LABORER		EOC:		LABOR		EOC:		LABOR		
		Yr Hours:	Yr Total Cost:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09
		0.0	0	0.0	0	0.0	2,297.9	1,395.6	0.0	0.0	0.0	0.0
		0.0	0	0.0	0	0.0	2,297.9	3,693.5	3,693.5	3,693.5	3,693.5	3,693.5
		0.0	0	0.0	0	0.0	140,963	90,689	0	0	0	0
		0	0	0	0	0	140,963	231,652	231,652	231,652	231,652	231,652

Resource:	WELDER Res Dept: 943	WELDER		EOC:		LABOR		EOC:		LABOR		
		Yr Hours:	Yr Total Cost:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09
		0.0	0	0.0	0	0.0	2,297.9	1,395.6	0.0	0.0	0.0	0.0
		0.0	0	0.0	0	0.0	2,297.9	3,693.5	3,693.5	3,693.5	3,693.5	3,693.5
		0	0	0	0	0	66,955	43,075	0	0	0	0
		0	0	0	0	0	66,955	110,030	110,030	110,030	110,030	110,030

Resource:	WSTENG Res Dept: 943	WASTE ENGINEER		EOC:		LABOR		EOC:		LABOR		
		Yr Hours:	Yr Total Cost:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09
		0.0	0	0.0	0	0.0	574.5	348.9	0.0	0.0	0.0	0.0
		0.0	0	0.0	0	0.0	574.5	923.4	923.4	923.4	923.4	923.4
		0	0	0	0	0	21,337	13,727	0	0	0	0
		0	0	0	0	0	21,337	35,064	35,064	35,064	35,064	35,064

Resource:	WSTENG Res Dept: 943	WASTE ENGINEER		EOC:		LABOR		EOC:		LABOR		
		Yr Hours:	Yr Total Cost:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09
		0.0	0	0.0	0	0.0	574.5	348.9	0.0	0.0	0.0	0.0
		0.0	0	0.0	0	0.0	574.5	923.4	923.4	923.4	923.4	923.4
		0	0	0	0	0	34,610	22,266	0	0	0	0
		0	0	0	0	0	34,610	56,876	56,876	56,876	56,876	56,876

**GRAND TOTALS:**

Resource:	WSTENG Res Dept: 943	WASTE ENGINEER		EOC:		LABOR		EOC:		LABOR		
		Yr Hours:	Yr Total Cost:	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09
		0.0	0	0.0	0	0.0	74,680.4	45,357.0	0.0	0.0	0.0	0.0
		0.0	0	0.0	0	0.0	74,680.4	120,037.4	120,037.4	120,037.4	120,037.4	120,037.4
		0	0	0	0	0	4,058,561	2,590,135	0	0	0	0
		0	0	0	0	0	4,058,561	6,648,696	6,648,696	6,648,696	6,648,696	6,648,696

CAM

CONTROL TEAM

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**HS3AG**

**SHIPPING**



**Fluor Fernald, Inc.**

7

PBS: 1.1.H.B SILO 3  
 WBS: 1.1.H.B SILO 3  
 CTRL ACCT: HS3A  
 CHARGE NO: HS3AG SHIPPING  
 COMMENTS: F07-025

DATE: 37,139  
 PROJECT MGR: Robert Fellman  
 CAM: Robert Fellman  
 PREPARED BY: Karen Wintz  
 FISCAL YEAR: FY01 - FY05

Resource: ODC700 EOC: ODC  
 Res Dept: 943 Overtime: ship Class:

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Units:	0.0	0.0	0.0	559,790.3	380,809.7	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	0.0	0.0	559,790.3	940,600.0	940,600.0	940,600.0	940,600.0	940,600.0	940,600.0
Yr Total Cost:	0	0	0	606,959	424,458	0	0	0	0	0
Cum Total Cost:	0	0	0	606,959	1,031,417	1,031,417	1,031,417	1,031,417	1,031,417	1,031,417

**GRAND TOTALS:**

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Total Cost:	0	0	0	606,959	424,458	0	0	0	0	0
Cum Total Cost:	0	0	0	606,959	1,031,417	1,031,417	1,031,417	1,031,417	1,031,417	1,031,417

CAM

*Robert Fellman*

CONTROL TEAM



**HS3AH**  
**SHUTDOWN**



**Fluor Fernald, Inc.**

PBS: 7

WBS: 1.1.H.B SILO 3

CTRL ACCT: HS3A SILO 3

CHARGE NO: HS3AH SHUTDOWN

COMMENTS: F07-025

DATE: 5-Sep-01

PROJECT MGR: Robert Fellman

CAM: Robert Fellman

PREPARED BY: Karen Wintz

FISCAL YEAR: FY01 - FY05

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)Resource: CHMOPR  
Res Dept: 943  
Overtime: Class: EOC: HOU LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	2,553.6	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	2,553.6	2,553.6	2,553.6	2,553.6	2,553.6	2,553.6
Yr Total Cost:	0	0	0	0	99,639	0	0	0	0	0
Cum Total Cost:	0	0	0	0	99,639	99,639	99,639	99,639	99,639	99,639

Resource: CRPNTR  
Res Dept: 943  
Overtime: Class: EOC: HOU LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	95.8	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	95.8	95.8	95.8	95.8	95.8	95.8
Yr Total Cost:	0	0	0	0	3,709	0	0	0	0	0
Cum Total Cost:	0	0	0	0	3,709	3,709	3,709	3,709	3,709	3,709

Resource: ELECTN  
Res Dept: 943  
Overtime: Class: EOC: HOU LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	638.4	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	638.4	638.4	638.4	638.4	638.4	638.4
Yr Total Cost:	0	0	0	0	25,022	0	0	0	0	0
Cum Total Cost:	0	0	0	0	25,022	25,022	25,022	25,022	25,022	25,022

Resource: ENGINEER  
Res Dept: 943  
Overtime: Class: EOC: SAL LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	319.2	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	319.2	319.2	319.2	319.2	319.2	319.2
Yr Total Cost:	0	0	0	0	27,449	0	0	0	0	0
Cum Total Cost:	0	0	0	0	27,449	27,449	27,449	27,449	27,449	27,449

Resource: ENGPRC  
Res Dept: 943  
Overtime: Class: EOC: SAL LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	638.4	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	638.4	638.4	638.4	638.4	638.4	638.4
Yr Total Cost:	0	0	0	0	44,694	0	0	0	0	0

**Fluor Fernald, Inc.**

PBS: 7

WBS: 1.1.H.B SILO 3  
CTRL ACCT: HS3A SILO 3  
CHARGE NO: HS3AH SHUTDOWN

COMMENTS: F07-025

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

DATE: 5-Sep-01

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman

PREPARED BY: Karen Wintz

FISCAL YEAR: FY01 - FY05

Cum Total Cost: 0 0 0 0 44,694 44,694 44,694 44,694 44,694

Resource: ENSTEC  
Res Dept: 943ENVIR SCIENTIST TECH  
Overtime:Class: LABOR  
EOC: SAL

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	63.8	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	63.8	63.8	63.8	63.8	63.8	63.8
Yr Total Cost:	0	0	0	0	2,261	0	0	0	0	0
Cum Total Cost:	0	0	0	0	2,261	2,261	2,261	2,261	2,261	2,261

Resource: FPRENG  
Res Dept: 943FIRE PROTECTION ENG  
Overtime:Class: LABOR  
EOC: SAL

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	31.9	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	31.9	31.9	31.9	31.9	31.9	31.9
Yr Total Cost:	0	0	0	0	1,732	0	0	0	0	0
Cum Total Cost:	0	0	0	0	1,732	1,732	1,732	1,732	1,732	1,732

Resource: HAZWAT  
Res Dept: 943HAZWAT  
Overtime:Class: LABOR  
EOC: HOU

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	1,596.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	1,596.0	1,596.0	1,596.0	1,596.0	1,596.0	1,596.0
Yr Total Cost:	0	0	0	0	57,464	0	0	0	0	0
Cum Total Cost:	0	0	0	0	57,464	57,464	57,464	57,464	57,464	57,464

Resource: HEOOPR  
Res Dept: 943HEAVY EQUIP OPERATOR  
Overtime:Class: LABOR  
EOC: HOU

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	2,553.6	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	2,553.6	2,553.6	2,553.6	2,553.6	2,553.6	2,553.6
Yr Total Cost:	0	0	0	0	100,470	0	0	0	0	0
Cum Total Cost:	0	0	0	0	100,470	100,470	100,470	100,470	100,470	100,470

Resource: INDHYG  
Res Dept: 943INDUSTRIAL HYGIENIST  
Overtime:Class: LABOR  
EOC: SAL

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0



# Fluor Fernald, Inc.

PBS: 7

DATE: 5-Sep-01

WBS: 1.1.H.B SILO 3  
CTRL ACCT: HS3A SILO 3  
CHARGE NO: HS3AH SHUTDOWN

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz

COMMENTS: F07-025

FISCAL YEAR: FY01 - FY05

	Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: INSMEC INSTRUMENT MECHANIC EOC: LABOR  
Res Dept: 943 Overtime: Class: HOU

	Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: LABCHM CHEMIST EOC: LABOR  
Res Dept: 943 Overtime: Class: SAL

	Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: MAT300 MATERIAL OBJCLASS300 EOC: MATERIAL  
Res Dept: 943 Overtime: Class: MAT

	Yr Units:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Units:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: MILLWRT MILLWRIGHT EOC: LABOR  
Res Dept: 943 Overtime: Class: HOU

	Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Resource: MNTMGR MAINTENANCE MGR EOC: LABOR  
Res Dept: 943 Overtime: Class: SAL

2

DATE: 5-Sep-01  
PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
	Sept 01	Sept 02	Sept 03	Sept 04	Sept 05	Sept 06	Sept 07	Sept 08	Sept 09	Sept 10
Yr Hours:	0.0	0.0	0.0	0.0	319.2	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	319.2	319.2	319.2	319.2	319.2	319.2
Yr Total Cost:	0	0	0	0	17,796	0	0	0	0	0
Cum Total Cost:	0	0	0	0	17,796	17,796	17,796	17,796	17,796	17,796

Resource: MNTREP  
Res Dept: 943  
Maintenance Rep  
OverTime:  
EOC: SAL  
LABOR

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	319.2	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	319.2	319.2	319.2	319.2	319.2	319.2
Yr Total Cost:	0	0	0	0	13,872	0	0	0	0	0
Cum Total Cost:	0	0	0	0	13,872	13,872	13,872	13,872	13,872	13,872

Resource:	MVOOPR	MOTOR VEHICLE OPER	EOC:	LABOR
Res Dept:	943	Overtime:	HOU	
		Class:		

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	638.4	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	638.4	638.4	638.4	638.4	638.4	638.4
Yr Total Cost:	0	0	0	0	23,042	0	0	0	0	0
Cum Total Cost:	0	0	0	0	23,042	23,042	23,042	23,042	23,042	23,042

Resource:	OILERM	OILER MAINTENANCE	EOC:	LABOR
Res Dept:	943	Overtime:	HOU	
		Class:		

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	31.9	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	31.9	31.9	31.9	31.9	31.9	31.9
Yr Total Cost:	0	0	0	0	1,061	0	0	0	0	0
Cum Total Cost:	0	0	0	0	1,061	1,061	1,061	1,061	1,061	1,061

Resource:	OPRMGR	OPERATIONS MGR	EOC:	LABOR
Res Dept:	943	Overtime:	SAL	
			Class:	

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	638.4	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	638.4	638.4	638.4	638.4	638.4	638.4
Yr Total Cost:	0	0	0	0	41,740	0	0	0	0	0
Cum Total Cost:	0	0	0	0	41,740	41,740	41,740	41,740	41,740	41,740

# Fluor Fernald, Inc.

ESTIMATE SUPPORT WORKSHEET  
FOR ACTIVITY BASED ESTIMATING  
(1 FTE EQUALS 1747 HOURS)

DATE: 5-Sep-01  
PROJECT MGR: Robert Fellman  
CAM: Robert Fellman  
PREPARED BY: Karen Wintz  
FISCAL YEAR: FY01 - FY05

PBS: 7  
WBS: 1.1.H.B SILO 3  
CTRL ACCT: HS3A SILO 3  
CHARGE NO: HS3AH SHUTDOWN  
COMMENTS: F07-025

Resource: PAINTR PAINTR EOC: LABOR  
Res Dept: 943 Overtime: Class: HOU

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0

Resource: PIPE FITTER PIPE FITTER EOC: LABOR  
Res Dept: 943 Overtime: Class: HOU

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0

Resource: PROJECT SUPPORT REP PROJECT SUPPORT REP EOC: LABOR  
Res Dept: 943 Overtime: Class: SAL

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0

Resource: QA ENGINEER QA ENGINEER EOC: LABOR  
Res Dept: 943 Overtime: Class: SAL

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0

Resource: RAD SUPERVISOR/MGR RAD SUPERVISOR/MGR EOC: LABOR  
Res Dept: 943 Overtime: Class: SAL

	Oct 00-	Oct 01-	Oct 02-	Oct 03-	Oct 04-	Oct 05-	Oct 06-	Oct 07-	Oct 08-	Oct 09-
Yr Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yr Total Cost:	0	0	0	0	0	0	0	0	0	0
Cum Total Cost:	0	0	0	0	0	0	0	0	0	0

# Fluor Fernald, Inc.

7

DATE: 5-Sep-01

## ESTIMATE SUPPORT WORKSHEET FOR ACTIVITY BASED ESTIMATING (1 FTE EQUALS 1747 HOURS)

 PROJECT MGR: Robert Fellman  
 CAM: Robert Fellman  
 PREPARED BY: Karen Wintz  
 FISCAL YEAR: FY01 - FY05

 PBS: 7  
 WBS: 1.1.H.B SILO 3  
 CTRL ACCT: HS3A SILO 3  
 CHARGE NO: HS3AH SHUTDOWN  
 COMMENTS: F07-025

	0	0	0	0	0	23,876	23,876	23,876	23,876	23,876	23,876
Cum Total Cost:											

 Resource: RADTEC  
 Res Dept: 943

 RAD TECH  
 Overtime:

 Class: LABOR  
 EOC: SAL

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	2,234.4	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	2,234.4	2,234.4	2,234.4	2,234.4	2,234.4	2,234.4
Yr Total Cost:	0	0	0	0	95,232	0	0	0	0	0
Cum Total Cost:	0	0	0	0	95,232	95,232	95,232	95,232	95,232	95,232

 Resource: RIGGER  
 Res Dept: 943

 RIGGER  
 Overtime:

 Class: LABOR  
 EOC: HOU

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	638.4	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	638.4	638.4	638.4	638.4	638.4	638.4
Yr Total Cost:	0	0	0	0	25,117	0	0	0	0	0
Cum Total Cost:	0	0	0	0	25,117	25,117	25,117	25,117	25,117	25,117

 Resource: S&HENG  
 Res Dept: 943

 SAFETY ENGINEER  
 Overtime:

 Class: LABOR  
 EOC: SAL

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	319.2	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	319.2	319.2	319.2	319.2	319.2	319.2
Yr Total Cost:	0	0	0	0	19,844	0	0	0	0	0
Cum Total Cost:	0	0	0	0	19,844	19,844	19,844	19,844	19,844	19,844

 Resource: TPSREP  
 Res Dept: 943

 TECH/PROG SUPT REP  
 Overtime:

 Class: LABOR  
 EOC: SAL

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	638.4	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	638.4	638.4	638.4	638.4	638.4	638.4
Yr Total Cost:	0	0	0	0	41,484	0	0	0	0	0
Cum Total Cost:	0	0	0	0	41,484	41,484	41,484	41,484	41,484	41,484

 Resource: TRNLAB  
 Res Dept: 943

 TRANSPORT LABORER  
 Overtime:

 Class: LABOR  
 EOC: HOU

	Oct 00- Sep 01	Oct 01- Sep 02	Oct 02- Sep 03	Oct 03- Sep 04	Oct 04- Sep 05	Oct 05- Sep 06	Oct 06- Sep 07	Oct 07- Sep 08	Oct 08- Sep 09	Oct 09- Sep 10
Yr Hours:	0.0	0.0	0.0	0.0	638.4	0.0	0.0	0.0	0.0	0.0
Cum Hours:	0.0	0.0	0.0	0.0	638.4	638.4	638.4	638.4	638.4	638.4
Yr Total Cost:	0	0	0	0	41,484	0	0	0	0	0
Cum Total Cost:	0	0	0	0	41,484	41,484	41,484	41,484	41,484	41,484





## **SECTION 2**

### **5.0 RISK PLAN**





# Risk/Opportunity Identification and Analysis Form

Project: Silo 3		PBS Number: 07		Total Baseline Dollars (Minimum Case): \$		\$39,250,146				
Evaluator: Karen Wintz		Date: March 21, 2001		WBS Number: 1.1.H.B						
CAM: Karen Wintz		Date: March 21, 2001		Control Account Number: H53A						
Project Task	Risk and/or Opportunity	Potential Impact	Internal or External	Impact Cost \$ (Maximum)	Risk Impact Level	Risk Probability %	Risk Probability Level	Probable Cost \$ (Likeliest)	Risk Critical Value	Risk Handling Strategy
Construction	Significant events or problems (project stand-down due to major injury, safety issues, major site events, contractor default, etc.).	Major construction schedule extension of 12 months.	Internal	\$3,780,000	5	10	2	\$378,000	8	Accept. Tie ins determined by previous contract. Little likelihood of change under facility use group changes.
Construction	Major re-work or re-design of facilities or processes after design complete due to changed design basis or functional requirements to support facility use by other projects.	Installed capital costs increase by 25% over baseline. Construction schedule slip 40%.	Internal	\$2,130,000	3	40	4	\$852,000	5	Avoid - Other uses must address risk in their scope. Combined risk should justify implementing change or not.
Construction	Minor construction schedule extension due to various issues (inclement weather, delays in equipment deliveries, minor re-work and/or replacement of damaged or unacceptable equipment, minor labor problems, etc.).	Construction schedule extension of 3 months, with additional costs for all groups.	Internal	\$645,000	3	60	4	\$387,000	5	Accept.
Construction	Vendors can't meet quality requirements on current schedule. Example: trackhoe PG3.	Increases cost of equipment and delays schedule.	Internal	\$500,000	3	60	4	\$300,000	5	Reduce - Establish PG requirements early and procure these items early. Do not be overly conservative with PG/QL assignments.
Construction	Fluor Farnald-approved DCNs are subsequently disapproved by EPA or others, resulting in re-work and/or additional labor to justify FF interpretation of the requirements.	Installed capital costs increase by 5% over baseline. Construction schedule slips 10%.	Internal	\$483,000	2	80	5	\$388,400	3	Reduce - Request equitable adjustment.
Construction	Self perform with minimally experienced subcontractors due to small business set asides.	Delays in construction of 2 months and increased cost of FF management.	Internal	\$430,000	2	40	3	\$172,000	2	Reduce - Hire FEMP-experienced small businesses to meet set aside requirements.
Construction	Insufficient schedule float between award and mobilization and/or lack of construction crafts causes delay. Includes training.	1 month schedule delay	Internal	\$215,000	2	30	2	\$84,600	2	Reduce - Ensure sufficient float between award and mobilization. Require 30-day pre-job meeting.
Construction	Cannot use ISA pad for containment foundation.	Increase in site prep costs. Additional concrete cost added for new foundation.	Internal	\$600,000	3	30	3	\$180,000	4	Accept
Construction	Long lead items delayed.	2 month construction schedule delay.	Internal	\$430,000	2	50	3	\$215,000	2	Reduce by issuing specs as early as possible.
Construction	Changed site conditions encountered during construction.	Cost of construction increases 10%.	Internal	\$280,000	2	40	3	\$112,000	2	Accept.
Construction	Anomalies and/or contamination are discovered during site prep work, resulting in significant delays while remediation work is performed.	Construction schedule extension of 2 months.	Internal	\$430,000	2	10	1	\$43,000	2	Accept.
Design	Schedule delays due to different interpretation of regulations and DOE Orders (e.g., DOE 413.3), resulting in extended review and approval periods by DOE-HQ and others.	Schedule extension of 4 months during middle and late stages of design for extended review and approval periods.	Internal	\$1,000,000	3	90	5	\$900,000	6	Accept

# Risk/Opportunity Identification and Analysis Form

Project: Silo 3		PBS Number: 07		Total Baseline Dollars (Minimum Case): \$		\$39,250,148	
Evaluator: Karen Wintz		WBS Number: 1.1.H.B					
CAM: Karen Wintz		Date: March 21, 2001					
		Control Account Number: HS3A					

Project Task	Risk and/or Opportunity	Potential Impact	Internal or External	Impact Cost \$ (Maximum)	Risk Impact Level	Risk Probability %	Risk Probability Level	Probable Cost \$ (Likeliest)	Risk Critical Value	Risk Handling Strategy
Design	Performance level/OL	Increase procurement costs.	Internal	\$965,000	3	40	4	\$386,000	5	Reduce - Ensure OL/PG requirements meet minimal levels only. Eliminate risk factor in PG ratings.
Design	Difficulty obtaining approval to cut silo drives new requirements and increases design effort.	Increased design and construction costs. Extension to design schedule.	Internal	\$1,042,000	3	80	5	\$933,600	6	Reduce - Involve likely dissenters in upfront planning and design. Start this activity ASAP.
Design	Use of supersaks as a new container on-site results in extensive review and inspection process.	Design cost increased 5% and container cost increased 50%.	Internal	\$2,738,000	3	70	4	\$1,916,600	5	Reduce - through management support and acceptance of new approaches and resultant risk.
Design	Significant increase in facility costs due to results of design data development work, design maturation, added safety/hazard reviews, etc.	Facility capital cost increase 25% above baseline estimate.	Internal	\$1,210,000	3	70	4	\$847,000	5	Reduce - Manage change control.
Design	Increased design labor costs due to numerous changes and re-work (internal sources).	Engineering costs increase 50% over original baseline. Schedule delayed 4 months.	Internal	\$1,350,000	3	30	3	\$405,000	4	Accept.
Design	Airborne issues. Data from Design Data Development Bench-scale data changes design approach.	Design change required. Schedule delay 2 months.	Internal	\$500,000	2	30	3	\$150,000	3	Reduce - Obtain data from Design Data Development Bench-scale data as soon as possible. Prioritize airborne testing.
Design	EPA major comments.	Construction and design delayed due to rework.	Internal	\$500,000	3	30	2	\$150,000	3	Reduce by communicating early and often with EPAs.
Design	Staffing not available or experienced with this type of work. Schedule delays.	2 month schedule extension.	Internal	\$500,000	2	30	2	\$150,000	2	Reduce - Plan design staffing early.
Design	Must contain entire Silos due to an accident evaluation.	Additional design, construction and equipment cost.	Internal	\$350,000	2	40	3	\$140,000	2	Accept.
Design	Changes in site utilities, land use, D&D, infrastructure, etc. cause significant changes in facility tie-ins, layout, etc.	Construction costs for utility and infrastructure work increase by 50% over baseline.	Internal	\$100,000	2	10	2	\$10,000	2	Accept - Tie ins determined by previous contract. Little likelihood of change under facility use group changes.
Design/construction/operation	Extensive changes in site procedures driven by Fluor Fernald drive new administrative and technical requirements.	Project cost increases 30%, schedule increases 1 year.	Internal	\$6,260,000	4	60	3	\$3,125,000	7	Reduce - Streamline procedures, do not increase.
Design/construction/operation	Removal operations categorized as a new facility activity rather than a safe shutdown-type activity.	Additional engineering controls required.	Internal	\$300,000	2	80	4	\$180,000	3	Accept.
NMMD Operations	Material delivery rate less than anticipated.	Extended production schedule by 1 hr.	Internal	\$3,000,000	3	60	4	\$1,500,000	5	Reduce.
NMMD Operations	Uranium Fire due to Uranium metal received and processed.	Equipment damage/process shutdown - 5 hr. extension due to equipment repair/restart and corrective actions.	Internal	\$8,000,000	4	60	3	\$4,000,000	7	Avoid.

# Risk/Opportunity Identification and Analysis Form

Project: Silo 3		PBS Number: 07		Total Baseline Dollars (Minimum Case): \$		\$39,250,146	
Evaluator: Karen Wintz		Date: March 21, 2001		WBS Number: 1.1.H.B			
CAM: Karen Wintz		Date: March 21, 2001		Control Account Number: HS3A			

Project Task	Risk and/or Opportunity	Potential Impact	Internal or External	Impact Cost \$ (Maximum)	Risk Impact Level	Risk Probability %	Risk Probability Level	Probable Cost \$ (Likeliest)	Risk Critical Value	Risk Handling Strategy
NMD-Operations	Excessive maintenance material and equipment incompatibility.	4-month extension due to series of shop repairs and maintenance on legs and increase in material costs.	Internal	\$4,000,000	3	60	4	\$2,400,000	6	Reduce.
NMD-Operations	Violation of criticality limits due to characterization or labeling or other personnel error.	6-month extension due to investigation or restart.	Internal	\$6,000,000	4	30	3	\$1,800,000	7	Avoid.
NMD-Operations	Self not available for blending.	3-month extension due to schedule.	Internal	\$3,000,000	3	30	3	\$900,000	4	Reduce.
NMD-Operations	WPRAP unable to receive material once blended.	3-month extension due to schedule.	Internal	\$3,000,000	3	40	3	\$1,200,000	4	Reduce.
NMD-Operations	Material control and accountability issues.	2-month delay while issues get resolved.	Internal	\$2,000,000	3	60	4	\$1,000,000	5	Reduce.
Operations	More material in silo than estimated.	Schedule extended and costs increase proportionally.	Internal	\$871,050	3	10	2	\$87,105	3	Accept.
Operations	No gondolas available due to WPRAP operating at capacity - known at start of operations design.	Must lease 14 gondolas from CSX, get superasks approved as IP-2 (this cost covered elsewhere), 6 month schedule delay.	Internal	\$2,420,000	4	50	4	\$1,210,000	8	Avoid - Make arrangements with CSX in advance or slow down WPRAP operations during this time period.
Operations	RMRS fails to provide Envirobond after design.	Stabilization formula must be redeveloped with other chemical. Schedule delay and chemical procurement costs.	Internal	\$3,100,000	3	90	5	\$2,790,000	6	Reduce - Develop alternate treatment formulation to eliminate schedule delay and incur chemical costs only.
Operations	Operations schedule extension due to labor issues (strikes, unavailability of replacements due to turnover of rad exposure limits, reduced productivity at end of project, etc.).	Operations schedule extended 6 months.	Internal	\$2,269,000	4	20	2	\$453,600	5	Accept.
Operations	Rail operator availability to move cars (due to sharing with WPRAP) delays loading operations.	Overtime to load containers increased 10%.	Internal	\$480,000	2	70	4	\$336,000	3	Reduce - through advance planning.
Operations	FHAR approval same as PHAR.	Schedule slip delays startup or drives major changes in operations plans - 2 months.	Internal	\$430,000	2	70	4	\$301,000	3	Reduce - Find methods to involve OFO early.
Operations	Coordination with mockup.	Must move pipe rack.	Internal	\$300,000	2	50	4	\$180,000	3	Reduce - Coordinate with AWR.
Operations	Conveyors extend into Silos/Downtime.	Operations schedule delay 1 month.	Internal	\$378,000	2	50	3	\$189,000	2	Reduce - through upfront planning.
Operations	Remote operation of excavator, visibility problems in silo, difficult maintenance, or difficulty fueling causes slow productivity.	Reduced productivity by 50%, with resultant increase in operations schedule and costs.	Internal	\$2,400,000	4	60	4	\$1,440,000	8	Reduce - Oversize excavator bucket to allow minimal ops w/o loss in throughput. Obtain extended warranty and vendor support, obtain service contract, lease-to-own, procure in advance for break-in period while not in contamination zone.

# Risk/Opportunity Identification and Analysis Form

Project: Silo 3		PBS Number: 07		Total Baseline Dollars (Minimum Case): \$		\$39,250,146	
Evaluator: Karen Wintz		Date: March 21, 2001		WBS Number: 1.1.H.B			
CAM: Karen Wintz		Date: March 21, 2001		Control Account Number: HS3A			

Project Task	Risk and/or Opportunity	Potential Impact	Internal or External	Impact Cost \$ (Maximum)	Risk Impact Level	Risk Probability %	Risk Probability Level	Probable Cost \$ (Likeliest)	Risk Critical Value	Risk Handling Strategy
Operations	Compromised silo integrity after cutting of opening.	Must expedite retrieval. Worst case silo failure resulting in fines and environmental release.	Internal	\$2,000,000	5	1	1	\$20,000	5	Reduce through engineering design and safety evaluation process.
Operations	Difficulty in cutting silo due to material behind wall.	Time to cut extended by 1 month.	Internal	\$378,000	2	60	4	\$226,800	3	Reduce - Subcontract to specialty vendor and/or perform mock up on Silo 4 if cost beneficial.
Operations	Environmental release of Radon or other hazardous material.	Fines and/or additional efforts and costs associated with INOVA etc.	Internal	\$2,000,000	3	10	1	\$200,000	3	Reduce - Contingency plan in RD Pkg.
Operations	Severe damage to facility control system due to lightning or power supply anomaly causes total shutdown of operations to complete repairs.	Operations schedule extended 3 months to repair/replace affected components.	Internal	\$1,134,000	3	5	1	\$56,700	2	Accept.
Operations	Chemical hazard found in Silo/Rad.	New controls and monitoring.	Internal	\$100,000	2	10	1	\$10,000	1	Accept.
Operations	Bag breaks during filling.	Shut down operations, clean up spill - 1 week.	Internal	\$95,000	2	10	1	\$9,500	1	Accept.
Operations	Increased ODCs due to sampling and analysis issues (higher than expected sampling/analytical requirements, revised approach for procuring analytical services, need DOE faster turnaround times, etc.).	Increased sampling costs of 30% over baseline.	Internal	\$21,000	1	20	2	\$4,200	1	Accept.
Operations	Heel removal slow.	1 month additional operations.	Internal	\$378,000	2	90	5	\$340,200	5	Reduce - Plan reasonable heel removal options in advance.
Operations	Added inspection, reporting, or procedural requirements from internal audits/assessments.	Increased labor cost of 5% of operations, plus 1 FTE to administer.	Internal	\$308,000	2	70	4	\$215,600	3	Avoid.
Operations	Increased labor costs due to inadequate estimate of overtime required for operations.	Increased labor cost for overtime premium from 40 hr/week to 50 hr/week.	Internal	\$1,800,000	3	50	3	\$900,000	4	Accept.
Operations	Increased labor costs due to inadequate staffing estimates.	O&M staffing increase of 10% over baseline during training, SOT, OHR, and operations period.	Internal	\$740,000	2	70	4	\$518,000	3	Accept.
Operations	Increased ODCs due to higher than expected chemical usage and/or price.	Chemical costs increase 50% over baseline cost.	Internal	\$100,000	2	30	3	\$30,000	2	Accept.
Operations	Increased ODCs due to higher than expected consumption and/or price of spare parts, consumables, supplies, etc.	Spare parts increase 50% over baseline.	Internal	\$670,000	3	40	3	\$268,000	4	Reduce - through planning.
Operations	Must operate 2 shifts to meet WPRAP completion schedule due to prior project delays.	Additional crew required from training through operations completion.	Internal	\$3,537,000	3	30	3	\$1,061,100	4	Reduce - Maintain schedule.
Operations	Bag breaks during loading into rail car.	Contamination outside and potential environmental release above RC, and 1 month shutdown.	Internal	\$378,000	2	30	3	\$113,400	2	Reduce - Lift plan and container inspections.
Operations	Increased cost to train new replacement workers.	5% increase in operations labor from baseline.	Internal	\$240,000	2	40	3	\$96,000	2	Accept.

# Risk/Opportunity Identification and Analysis Form

Project: Silo 3		PBS Number: 07		Total Baseline Dollars (Minimum Case): \$		\$39,250,146				
Evaluator: Karen Wintz		Date: March 21, 2001		WBS Number: 1.1.H.B						
CAM: Karen Wintz		Date: March 21, 2001		Control Account Number: HS3A						
Project Task	Risk and/or Opportunity	Potential Impact	Internal or External	Impact Cost \$ (Maximum)	Risk Impact Level	Risk Probability %	Risk Probability Level	Probable Cost \$ (Likeliest)	Risk Critical Value	Risk Handling Strategy
Operations	Increases ODCs due to higher than expected quantities of secondary waste, some of which requires off-site disposal.	Secondary waste costs increase 10% over baseline estimate.	Internal	\$20,000	2	60	4	\$12,000	5	Accept.
Operations	Material loaded into gondolas fails TCLP and must be retreated.	1 month schedule extension to incorporate retreatments.	Internal	\$328,000	2	40	2	\$37,800	2	Reduce - Develop robust treatment formulation.
Operations	Material loaded into gondolas fails TCLP and must be retreated off-site.	Cost to ship off-site and treat material.	Internal	\$320,400	2	10	2	\$32,040	2	Reduce - Develop robust treatment formulation.
Operations	Major operations schedule extension due to accident or mishap during transportation to Envirocare.	6 month delay in project to switch to truck transportation.	Internal	\$2,268,000	4	1	1	\$22,680	3	Reduce - Ensure containers can be shipped by truck to shorten shutdown.
Operations	Major operations schedule extension due to significant events or process problems (project shutdown due to major injury, safety issues, releases to environment, major process re-design, equipment failure, etc.).	Operations schedule extended 12 months.	Internal	\$6,000,000	5	20	2	\$1,200,000	3	Accept.
Operations	Manpower shortage for operations preventing due to AWR OPS startup.	Startup schedule extended by 4 months.	Internal	\$1,500,000	3	70	5	\$1,050,000	6	Reduce - Obtain additional resources in advance to prevent schedule delay if problem becomes evident.
Operations	Delay in obtaining maintenance personnel due to sharing with AWR.	Operating duration increase of 5%.	Internal	\$240,000	2	50	3	\$120,000	2	Reduce through advance planning, extended equipment warranties for service through vendor, vendor technical support or lease-to-own arrangements.
Operations	Minor operations schedule extension due to minor process problems (excessive waste variability, airborne problems, plugging, higher maintenance, lower availability, unavailability of key spare parts, normal startup problems, etc.).	Operations schedule extended 2 months.	Internal	\$756,000	2	80	5	\$604,800	3	Reduce - Consider risk in design basis.
Project Management	Extensive internal audits cause project to increase documentation labor.	Project cost increases 10%.	Internal	\$2,500,000	3	90	5	\$2,250,000	6	Reduce - Minimize audits and focus scope of audits.
Shipping	DOT exemption on gondola fails and containers cannot be approved as IP-2.	Must design around new container, 6 month schedule impact and major design change. Box container costs added.	Internal	\$2,888,000	4	30	3	\$865,800	4	Reduce - Obtain approval of supersaks as IP-2 in advance. Incur cost of approval.
Shipping	CSX raises cost of shipping for modifying rail tender.	Cost increase for shipping of 30%.	Internal	\$280,000	2	70	4	\$196,000	3	Reduce - Try to negotiate no cost change.
Shipping	DOT exemption on Gondola fails.	Must get supersaks approved as IP-2. Additional labor for approval process.	Internal	\$100,000	2	50	3	\$50,000	3	Accept.

# Risk/Opportunity Identification and Analysis Form

Project: Silo 3		PBS Number: 07		Total Baseline Dollars (Minimum Case): \$		\$39,250,146	
Evaluator: Karen Wintz		Date: March 21, 2001		WBS Number: 1.1.H.B			
CAM: Karen Wintz		Date: March 21, 2001		Control Account Number: HS3A			

Project Task	Risk and/or Opportunity	Potential Impact	Internal or External	Impact Cost \$ (Maximum)	Risk Impact Level	Risk Probability %	Risk Probability Level	Probable Cost \$ (Likeliest)	Risk Critical Value	Risk Handling Strategy
Shipping	No gondolas available due to WPRAP operating at capacity - known during design.	Must lease 14 gondola cars from CSX, get supersacks approved as IP-2 (this cost covered elsewhere), get new rail cars approved for use at FEMP.	Internal	\$150,000	2	70	4	\$105,000	5	Accept.
Shipping	Silo 3 shipping schedule extends beyond WPRAP shipping operation schedule.	Silo 3 must assume costs of administering and maintaining rail shipment program.	Internal	\$945,000	2	10	1	\$84,500	1	Accept.
Shipping	Rail tender mod fails - CSX will not grant.	Must ship by truck.	Internal	\$3,000,000	4	20	1	\$600,000	3	Accept.
Shutdown	Ability to decontaminate Silo to OSDF limits.	Additional 2 months operations to decon silo.	Internal	\$756,000	2	50	4	\$378,000	3	Reduce - Plan ahead with multiple decon approaches.
Startup	Operations startup delay and/or schedule extension due to site problems (AWWT outages, utility outages, site stand-down due to accident/release, etc.).	Operations schedule extension of 6 months, with additional costs for all groups.	Internal	\$2,268,000	4	40	3	\$907,200	7	Reduce.
Startup	Schedule delays during SOT, ORR, and or Operations due to unavailability of site support services and/or facilities (due to downsizing/closure).	Schedule extension of 2 months during SOT, ORR, and/or operations period, with additional costs for all groups. (Alternate impacts is cost of procuring temporary/outside services to fill the void.)	Internal	\$756,000	2	30	3	\$228,800	2	Accept.
Startup	Training resources shared with AVR delay schedule.	2 month schedule extension.	Internal	\$750,000	2	50	4	\$375,000	3	Reduce - Monitor schedules and plan ahead.
Startup	HMRS doesn't provide technical support as required in settlement.	FF must provide technical support.	Internal	\$100,000	2	70	5	\$70,000	3	Accept.
			TOTALS	\$78,849,450				\$32,469,125		
Design	Increased design labor costs due to numerous changes and re-work (external sources).	Engineering costs increase 50% over original baseline. Schedule delayed 4 months.	External	\$1,350,000	3	30	3	\$405,000	4	Accept.
Design	Public or other stakeholders do not accept supersacks due to perception.	Must design around other container. Major schedule impact for design change with 6 month impact, and additional cost of change in shipping method, system design changes for loading, additional labor to lid and manage containers during operations.	External	\$10,000,000	5	20	2	\$2,000,000	8	Reduce - Early and often communication and involvement.
Design	EPA approval of RD Package delayed.	Construction and design delayed 1 month.	External	\$250,000	2	20	2	\$50,000	2	Reduce - Communicate with EPA.
Design	PHAR approval delayed due to inability to involve OFO in PHAR development.	Schedule slip of 2 months delays long lead procurements.	External	\$500,000	2	60	4	\$300,000	3	Reduce - Find methods to involve OFO early.
Design	Significant increase in facility costs due to added requirements from reviews by external groups (DNFSB, CT, EPA, DOE-HQ, FCAB, etc.).	Facility costs increase 25% above baseline.	External	\$1,208,000	3	80	5	\$984,800	6	Accept.

# Risk/Opportunity Identification and Analysis Form

Project: Silo 3		PBS Number: 07		Total Baseline Dollars (Minimum Case): \$		\$39,250,146				
Evaluator: Karen Wintz		Date: March 21, 2001		WBS Number: 1.1.H.B						
CAM: Karen Wintz		Date: March 21, 2001		Control Account Number: H53A						
Project Task	Risk and/or Opportunity	Potential Impact	Internal or External	Impact Cost \$ (Maximum)	Risk Impact Level	Risk Probability %	Risk Probability Level	Probable Cost \$ (Likeliest)	Risk Critical Value	Risk Handling Strategy
Construction	EPA delayed turnaround of DCNs.	Construction schedule slips 1 month.	External	\$215,000	2	80	5	\$172,000	3	Accept.
Operations	Added inspection, reporting, or procedural requirements for external audits/assessments.	Increased labor cost of 5% of operations.	External	\$240,000	2	70	5	\$168,000	3	Accept.
Operations	Major operations schedule extension due to significant external transportation and/or disposal problems (Envirocare shutdown, public opposition en route or at Envirocare, etc.).	Operations schedule extended 12 months.	External	\$6,000,000	5	20	2	\$1,200,000	3	Accept.
Operations	Minor operations schedule extension due to short-term transportation and/or disposal problems (railroad strike, inadequate handling capacity at Envirocare, inadequate turn-around time of railcars at Envirocare, inavailability of railcars, etc.).	Operations schedule extension of 3 months.	External	\$1,134,000	3	50	3	\$567,000	4	Accept.
Disposal	Envirocare waste acceptance criteria changes due to regulation or license change.	Design change required.	External	\$300,000	3	10	1	\$30,000	1	Accept.
Disposal	Envirocare cost increases to DOE due to handling supersacks.	Price increases 30% over current baselined value.	External	\$230,000	2	60	4	\$138,000	3	Accept.

Project Task	Opportunity	Potential Impact	Internal or External	Impact Cost \$ (Maximum)	Risk Impact Level	Risk Probability %	Risk Probability Level	Probable Cost \$ (Likeliest)	Risk Critical Value	Risk Handling Strategy
Construction	Hire WISE or other contractor and eliminate bid cycle.	Reduce construction schedule by 2 months.	Internal	-\$400,000		80		-\$320,000		
Design	Another disposal site opens.	Disposal price reduced 20%.	Internal	-\$153,000		30		-\$45,900		
Design/Safety Basis Documentation	Obtain exemption to prepare new PHAR, based on existing RMRS PHAR and OUA HAR.	Eliminate cost of preparing PHAR and reduce schedule risk. Equipment procurement can be accelerated.	Internal	-\$200,000		30		-\$60,000		Pursue this strategy with DOE.
Disposal	Envirocare cost reduced using volume by w/density calculations for disposal volume, not survey volume.	Cost reduced from \$115/cy to \$103/cy.	Internal	-\$80,000		70		-\$56,000		Pursue this strategy with Envirocare.
Operations	Only 1900 tons material in Silo 3.	Treatment cost and schedule reduced by 50%.	Internal	-\$3,000,000		50		-\$1,500,000		
Operations	Send Silo 3 material in bulk through WPHAP to Envirocare.	Packaging in Lift Liners eliminated, IT processes material.	Internal	-\$400,000		10		-\$40,000		
Operations	Treatment offsite can be performed at reduced cost.	Project cost reduced 10%.	Internal	-\$2,500,000		10		-\$250,000		

